Metalliferous Mining Training Package

MNM99

VOLUME III of III

Volume I  Introduction, Assessment Guidelines, Qualifications plus Core and Open Cut competency standards.

Volume II  Competency standards for: Underground; Processing & Exploration

Volume III  Competency standards for: Mine Management; General Management & Technical Management

Endorsed by the National Training Framework Committee and agreed by Ministers 12/11/1999.

This training package is to be reviewed by 30/04/2003.

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Version 3
List of Qualifications

Metalliferous Mining Training Package - MNM99 V3.00

MNM20103  Certificate II in Metalliferous Mining Operations (Open Cut)
MNM20203  Certificate II in Metalliferous Mining Operations (Underground)
MNM20303  Certificate II in Metalliferous Mining Operations (Processing)
MNM30103  Certificate III in Metalliferous Mining Operations (Open Cut)
MNM30203  Certificate III in Metalliferous Mining Operations (Underground)
MNM30303  Certificate III in Metalliferous Mining Operations (Processing)
MNM40103  Certificate IV in Metalliferous Mining Operations (Open Cut)
MNM40203  Certificate IV in Metalliferous Mining Operations (Underground)
MNM40303  Certificate IV in Metalliferous Mining Operations (Processing)
MNM50299  Diploma of Metalliferous Mining (Open Cut and Underground)
MNM50399  Diploma of Metalliferous Mining (Processing)
MNM60101  Advanced Diploma of Metalliferous Mining
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Training packages are not static documents. Changes are made periodically to reflect the latest industry practices.

Before commencing any form of training or assessment, you must ensure delivery is from the current version of the Training Package.

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- Access the ATP website (http://www.atpl.net.au) and check the latest Print Number.
- In cases where the Print Version Number is later than yours, the Print Version Modification History in the Training Package sample on the ATP website will indicate the changes that have been made.

The Modification History is also available on the website of the developer of the Training Package: National Mining Industry Industry Training Advisory Body Ltd
http://www.miningitab.com.au

The National Training Information Service (http://www.ntis.gov.au) also displays any changes in Units of Competency and the packaging of qualifications.
<table>
<thead>
<tr>
<th>Version</th>
<th>Date of Release</th>
<th>Authorisation</th>
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| 3       | 10/07/2003     | NTQC          | Update of Training Package to align to licensing requirements in the Metalliferous sector, includes:  
• Amendments to existing qualifications  
• Amendments to existing units of competency  
• Insertion of new units of competency |
| 2.00    | 22/01/2002     | NTQC          | Category 1 changes: deletion of duplicated unit of competency and new title for one unit. MNMUGC111A deleted, MNMUGC110A retitled plus correction of a small number of typographical errors in the Mine Management Services units of competency. Category 3 changes: Insertion of an Advanced Diploma qualification, comprising of an additional 32 units of competency aligned at this level |
| 1.00    | 12/11/1999     | NTFC          | Primary Release |

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Metalliferous Mining Training Package (MNM99)

Index of Competency Standards

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DETAILS OF THE COMPETENCY STANDARDS

The following Tables 1-7 provide an outline listing all the units of competency relevant to personnel working within the Metalliferous Mining sector. Full details of the units of competency are attached.

Table 1: Metalliferous Core Competencies

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<td>MNMCCCOO005A</td>
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<tr>
<td>MNMOCC103A</td>
<td>Drilling, Blasting &amp; Ground Support</td>
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<tr>
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<td>MNMOCC203A</td>
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<td>Prepare for dredging operations</td>
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<td>MNMOCC1421A</td>
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<td>MNMOCC532A</td>
<td>Stockpiling &amp; Preparation</td>
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<td>MNMOCC533A</td>
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<td>MNMUGC118A</td>
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Table 3: Extraction Underground Competencies
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Table 4: Processing Competencies

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### Table 5: Geo Technical Survey and Environmental Management Competencies

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<td>Geological Survey</td>
<td>Plan and undertake field trip</td>
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<td>Conduct fieldwork</td>
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<td>MNMAAA304A</td>
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<td>Collect and prepare samples</td>
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<td>Undertake process or project environmental impact assessment</td>
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### Table 6: Mine Management Services Competencies

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<td>Select and commission surface mining operations plant and equipment</td>
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<td>Plan and monitor water management</td>
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<td>Plan and monitor recycled materials operation</td>
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<td>Design stockpile formations and recycling systems</td>
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<td>Lead and monitor surface mining operations and report outcomes</td>
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Table 7: Mine Managers Competencies (General and Technical)
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<td>Establish and Manage the Management Information System</td>
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<td>Mine Manager</td>
<td>Manage the decision making process</td>
<td>6</td>
</tr>
<tr>
<td>MNIL06A</td>
<td>Mine Manager</td>
<td>Provide leadership</td>
<td>6</td>
</tr>
<tr>
<td>MNIL07A</td>
<td>Mine Manager</td>
<td>Manage organisational change</td>
<td>6</td>
</tr>
<tr>
<td>MNIL08A</td>
<td>Mine Manager</td>
<td>Manage group process</td>
<td>6</td>
</tr>
<tr>
<td>MNIL09A</td>
<td>Mine Manager</td>
<td>Manage major incidents and emergencies</td>
<td>6</td>
</tr>
<tr>
<td>MNIL10A</td>
<td>Mine Manager</td>
<td>Evaluate and respond to business influences</td>
<td>6</td>
</tr>
<tr>
<td>MNIL11A</td>
<td>Mine Manager</td>
<td>Resource minesite plans and objectives</td>
<td>6</td>
</tr>
<tr>
<td>MNIL12A</td>
<td>Mine Manager</td>
<td>Evaluate and enhance minesite performance</td>
<td>6</td>
</tr>
<tr>
<td>MNIL13A</td>
<td>Mine Manager</td>
<td>Initiate, monitor and supervise contracts</td>
<td>6</td>
</tr>
<tr>
<td>MNIL14A</td>
<td>Mine Manager</td>
<td>Establish and implement operational management plans</td>
<td>6</td>
</tr>
<tr>
<td>MNIL15A</td>
<td>Mine Manager</td>
<td>Manage customer service</td>
<td>6</td>
</tr>
<tr>
<td>MNIL16A</td>
<td>Mine Manager</td>
<td>Conduct business negotiations</td>
<td>6</td>
</tr>
<tr>
<td>MNIL17A</td>
<td>Mine Manager</td>
<td>Establish the mine statutory/legal compliance system</td>
<td>6</td>
</tr>
<tr>
<td>MNIC02A</td>
<td>Mine Manager</td>
<td>Establish the mine risk assessment and control system</td>
<td>6</td>
</tr>
<tr>
<td>MNIC03A</td>
<td>Mine Manager</td>
<td>Establish mine infrastructure and plant systems</td>
<td>6</td>
</tr>
<tr>
<td>MNIC04A</td>
<td>Mine Manager</td>
<td>Establish mine services systems</td>
<td>6</td>
</tr>
<tr>
<td>MNIC05A</td>
<td>Mine Manager</td>
<td>Establish plant, equipment and infrastructure maintenance systems</td>
<td>6</td>
</tr>
<tr>
<td>MNIC06A</td>
<td>Mine Manager</td>
<td>Establish the mine water management system</td>
<td>6</td>
</tr>
<tr>
<td>MNIC07A</td>
<td>Mine Manager</td>
<td>Establish the stockpile management systems</td>
<td>6</td>
</tr>
<tr>
<td>MNIC08A</td>
<td>Mine Manager</td>
<td>Establish waste and by product management system</td>
<td>6</td>
</tr>
<tr>
<td>Unit #</td>
<td>Title</td>
<td>Source / Types of Changes</td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td>----------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>MNMCCCO1002A</td>
<td>Work Safely</td>
<td>MNMCCCO1002A - new code and amendments to “tidy up” unit, including removal of content relating to environment, first aid and site security, and adding of specific occupational health issues</td>
<td></td>
</tr>
<tr>
<td>MNMCCCOO002A</td>
<td>Perform initial response first aid</td>
<td>New unit based on ANTA Guideline Competency Standards for First Aid</td>
<td></td>
</tr>
</tbody>
</table>

**Mapping of Changes to Units of Competency**

**Field: Core Units**

<table>
<thead>
<tr>
<th>Unit #</th>
<th>Title</th>
<th>Source / Types of Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MNMUGC1101A</td>
<td>Set up &amp; prepare for ground support</td>
<td>MNMUGC101A - new code and change of title and removal of references to conducting drilling and use of explosives</td>
</tr>
<tr>
<td>MNMUGC1102A</td>
<td>Install ground support - bolting and meshing</td>
<td>MNMUGC102A - new change of title and separating out shot-</td>
</tr>
<tr>
<td>Replaces</td>
<td>Action</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>--------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>MNMUGC102A</td>
<td>Replaces</td>
<td>MNMUGC118A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Charge underground blasts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>New unit</td>
</tr>
<tr>
<td>MNMUGC109A</td>
<td>Replaces</td>
<td>MNMUGC110A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Administer shotfiring activities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>New unit and new code</td>
</tr>
<tr>
<td>MNMMN1301A</td>
<td>Replace</td>
<td>MNMUGC120A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Apply shotfiring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>New unit and new code</td>
</tr>
<tr>
<td>MNMMN1402A</td>
<td>Replace</td>
<td>MNMUGC121A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fire shots</td>
</tr>
<tr>
<td></td>
<td></td>
<td>New unit and new code</td>
</tr>
<tr>
<td>MNMUGC120A</td>
<td>Replace</td>
<td>MNMUGC121A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Apply shot-crete</td>
</tr>
<tr>
<td></td>
<td></td>
<td>New unit. Based on MNMUGC102A - separating out shot-creting</td>
</tr>
<tr>
<td>MNMUGC121A</td>
<td>Replace</td>
<td>MNMUGC124A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Install sets</td>
</tr>
<tr>
<td></td>
<td></td>
<td>New unit. Based on MNMUGC102A - separating out installing of sets</td>
</tr>
<tr>
<td>MNMUGC124A</td>
<td></td>
<td>Conduct airleg mining</td>
</tr>
<tr>
<td></td>
<td></td>
<td>New unit</td>
</tr>
</tbody>
</table>
### Major Activity: Extraction Underground
#### Field: Loading & Hauling

<table>
<thead>
<tr>
<th>Unit #</th>
<th>Title</th>
<th>Source / Types of Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MNMUGC1216A</td>
<td>Conduct skip operations</td>
<td>MNMUGC216A - new code, change to title and amendments to closer align to licensing requirements</td>
</tr>
<tr>
<td>Replaces</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MNMUGC216A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MNMUGC1217A</td>
<td>Operate automated winder</td>
<td>MNMUGC217A - new code and based on this unit, with specific amendments</td>
</tr>
<tr>
<td>Replaces</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MNMUGC217A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MNMUGC1218A</td>
<td>Operate manual winder</td>
<td>MNMUGC218A - new code and change to title and amendments to closer align to licensing requirements</td>
</tr>
<tr>
<td>Replaces</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MNMUGC218A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MNMUGC224A</td>
<td>Conduct cage operations</td>
<td>New unit proposed to cover the function of “platman”</td>
</tr>
<tr>
<td>MNMUGC225A</td>
<td>Operate winder for shaft sinking</td>
<td>New unit</td>
</tr>
<tr>
<td>MNMUGC226A</td>
<td>Maintain winder equipment</td>
<td>New unit</td>
</tr>
<tr>
<td>MNMUGC227A</td>
<td>Inspect and maintain shafts and structures</td>
<td>New unit</td>
</tr>
<tr>
<td>MNMUGC228A</td>
<td>Monitor, inspect and service ropes and attachments</td>
<td>New unit</td>
</tr>
</tbody>
</table>

### Major Activity: Extraction Underground
#### Field: Ancillary Mine Support

<table>
<thead>
<tr>
<th>Unit #</th>
<th>Title</th>
<th>Source / Types of Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MNMMN1303A</td>
<td>Handle and transport explosives</td>
<td>MNMUGC441A - new code and amendments to reflect licensing requirements</td>
</tr>
<tr>
<td>Replaces</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MNMUGC441A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MNMUGC442A</td>
<td>Operate light vehicle underground</td>
<td>New unit based on MNMOCC426A - new code plus specific components for underground</td>
</tr>
<tr>
<td>MNMUGC443A</td>
<td>Refuel vehicles / machines underground</td>
<td>New unit</td>
</tr>
</tbody>
</table>
## Major Activity: Extraction Underground
### Field: Stockpiling and Preparation

<table>
<thead>
<tr>
<th>Unit #</th>
<th>Title</th>
<th>Source / Types of Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MNMMNI302A</td>
<td>Conduct secondary firing</td>
<td>Based on MNMUGC543A - new code and some changes to tidy up unit</td>
</tr>
<tr>
<td>Replaces MNMUGC543A</td>
<td></td>
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</tr>
</tbody>
</table>

## Major Activity: Processing
### Field: General Processing

<table>
<thead>
<tr>
<th>Unit #</th>
<th>Title</th>
<th>Source / Types of Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MNMPRD110A</td>
<td>Monitor tailings dam environment</td>
<td>MNMPRD110A - new code, change to title and change from mandatory core to optional</td>
</tr>
<tr>
<td>Replaces MNMPRD110A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MNMPRD1114A</td>
<td>Perform process control room operations</td>
<td>MNMPRD1114A - new code and additional PCs and element</td>
</tr>
<tr>
<td>Replaces MNMPRD114A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MNMPRD117A</td>
<td>Maintain auxiliary plant and equipment operation</td>
<td>New unit</td>
</tr>
</tbody>
</table>

## Major Activity: Processing
### Field: Handling and Pre-treatment

<table>
<thead>
<tr>
<th>Unit #</th>
<th>Title</th>
<th>Source / Types of Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MNMPRD224A</td>
<td>Operate and monitor filter processes</td>
<td>New unit</td>
</tr>
</tbody>
</table>

## Major Activity: Processing
### Field: Refining

<table>
<thead>
<tr>
<th>Unit #</th>
<th>Title</th>
<th>Source / Types of Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MNMPRD450A</td>
<td>Monitor casting quality</td>
<td>New unit</td>
</tr>
</tbody>
</table>

## Major Activity: Processing
### Field: Smelting

<table>
<thead>
<tr>
<th>Unit #</th>
<th>Title</th>
<th>Source / Types of Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MNMPRD1553A</td>
<td>Operate furnaces</td>
<td>MNMPRD553A - new code and</td>
</tr>
<tr>
<td>Replaces</td>
<td>MNMPRD553A</td>
<td>element re-named, PCs added.</td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>MNMPRD554A</td>
<td>Operate converters</td>
<td>New unit</td>
</tr>
<tr>
<td>MNMPRD555A</td>
<td>Supply molten metal and additives to furnaces</td>
<td>New unit</td>
</tr>
<tr>
<td>MNMPRD556A</td>
<td>Tap furnaces</td>
<td>New unit</td>
</tr>
<tr>
<td>MNMPRD557A</td>
<td>Control molten metal in holding furnace/vessel</td>
<td>New unit</td>
</tr>
<tr>
<td>MNMPRD558A</td>
<td>Monitor and control furnace combustion gases</td>
<td>New unit</td>
</tr>
</tbody>
</table>

**Major Activity: Extraction Open Cut**  
**Field: Loading and Hauling**

<table>
<thead>
<tr>
<th>Unit #</th>
<th>Title</th>
<th>Source / Types of Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MNMOCC201A</td>
<td>Conduct excavator operations</td>
<td>New unit based on MNMOCC206A</td>
</tr>
<tr>
<td>MNMOCC202A</td>
<td>Conduct electric rope shovel operations</td>
<td>New unit based on MNMOCC206A</td>
</tr>
<tr>
<td>MNMOCC203A</td>
<td>Conduct hydraulic shovel operations</td>
<td>New unit based on MNMOCC206A</td>
</tr>
<tr>
<td>MNMOCC1206A</td>
<td>Conduct shovel/excavator operations</td>
<td>New code. Element 'Carry out operator maintenance' removed</td>
</tr>
<tr>
<td>MNMOCC1102A</td>
<td>Drill in an open cut environment</td>
<td>New code. Element 'Carry out operator maintenance' removed</td>
</tr>
<tr>
<td>MNMOCC1207A</td>
<td>Conduct front end loader operations</td>
<td>New code. Element 'Carry out operator maintenance' removed</td>
</tr>
<tr>
<td>MNMOCC1208A</td>
<td>Conduct truck operations</td>
<td>New code. Element 'Carry out operator maintenance' removed</td>
</tr>
<tr>
<td>MNMOCC1209A</td>
<td>Conduct dozer operations</td>
<td>Element 'Carry out operator maintenance' removed</td>
</tr>
<tr>
<td>Unit Code</td>
<td>Description</td>
<td>Notes</td>
</tr>
<tr>
<td>------------</td>
<td>--------------------------------------------------</td>
<td>------------------------------------------------------------</td>
</tr>
<tr>
<td>MNMOCC1210A</td>
<td>Conduct scraper operations</td>
<td>New code. Element 'Carry out operator maintenance' removed</td>
</tr>
<tr>
<td>Replaces MNMOCC210A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MNMOCC1211A</td>
<td>Conduct loading and hauling support equipment operations</td>
<td>New code. Element 'Carry out operator maintenance' removed</td>
</tr>
<tr>
<td>Replaces MNMOCC211A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MNMOCC1212A</td>
<td>Conduct conveyor operations</td>
<td>New code. Element 'Carry out operator maintenance' removed</td>
</tr>
<tr>
<td>Replaces MNMOCC212A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MNMOCC1418A</td>
<td>Transport plant equipment and personnel</td>
<td>New code. Element 'Carry out operator maintenance' removed</td>
</tr>
<tr>
<td>Replaces MNMOCC418A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MNMOCC1421A</td>
<td>Operate from an elevated work platform</td>
<td>New code. Element 'Carry out operator maintenance' removed</td>
</tr>
<tr>
<td>Replaces MNMOCC421A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MNMOCC1422A</td>
<td>Operate roller/compactor</td>
<td>New code. Element 'Carry out operator maintenance' removed</td>
</tr>
<tr>
<td>Replaces MNMOCC422A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MNMOCC1423A</td>
<td>Operate forklift</td>
<td>New code. Element 'Carry out operator maintenance' removed</td>
</tr>
<tr>
<td>Replaces MNMOCC423A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MNMOCC1424A</td>
<td>Conduct crane operations</td>
<td>New code. Element 'Carry out operator maintenance' removed</td>
</tr>
<tr>
<td>Replaces MNMOCC424A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MNMOCC1425A</td>
<td>Conduct grader operations</td>
<td>New code. Element 'Carry out operator maintenance' removed</td>
</tr>
<tr>
<td>Replaces MNMOCC425A</td>
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</tr>
</tbody>
</table>

**NOTE:**
If an operator does conduct regular maintenance this is covered by the following units of competency (adapted from the Open Cut qualifications from the Coal Training Package MNC98):
<table>
<thead>
<tr>
<th>Unit #</th>
<th>Title</th>
<th>Source / Types of Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MNMOCC220A</td>
<td>Apply operational maintenance skills</td>
<td>Replaces 'Carry out operator maintenance' in the above units</td>
</tr>
<tr>
<td>MNMOCC221A</td>
<td>Service mine plant and equipment.</td>
<td>Replaces 'Carry out operator maintenance' in the above units</td>
</tr>
</tbody>
</table>
Mine Management Services - Units of Competency

<table>
<thead>
<tr>
<th>Unit Code</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MNMF5FX01A</td>
<td>Implement and maintain statutory / legal compliance systems</td>
<td>27</td>
</tr>
<tr>
<td>MNMF5FX02A</td>
<td>Implement and maintain pit development systems</td>
<td>33</td>
</tr>
<tr>
<td>MNMF5FX03A</td>
<td>Implement and maintain surface mining operations</td>
<td>39</td>
</tr>
<tr>
<td>MNMF5FX04A</td>
<td>Select and commission surface mining plant and equipment</td>
<td>53</td>
</tr>
<tr>
<td>MNMF5FX05A</td>
<td>Plan, conduct and oversee drilling operations</td>
<td>63</td>
</tr>
<tr>
<td>MNMF5FX06A</td>
<td>Manage blasting operations</td>
<td>71</td>
</tr>
<tr>
<td>MNMF5FX07A</td>
<td>Plan and monitor water management</td>
<td>77</td>
</tr>
<tr>
<td>MNMF5FX08A</td>
<td>Plan and monitor recycled material operations</td>
<td>85</td>
</tr>
<tr>
<td>MNMF5FX09A</td>
<td>Design stockpile formations and reclaiming systems</td>
<td>91</td>
</tr>
<tr>
<td>MNMF5FX10A</td>
<td>Design, implement and maintain process control systems</td>
<td>97</td>
</tr>
<tr>
<td>MNMF5FX11A</td>
<td>Implement the ventilation management system</td>
<td>103</td>
</tr>
<tr>
<td>MNMF5FX12A</td>
<td>Design systems for stable mining</td>
<td>111</td>
</tr>
<tr>
<td>MNMF5FX13A</td>
<td>Implement mine transport systems and production equipment</td>
<td>117</td>
</tr>
<tr>
<td>MNMF5FX14A</td>
<td>Implement mine services systems</td>
<td>123</td>
</tr>
<tr>
<td>MNMF5FX15A</td>
<td>Implement mine fixed plant and infrastructure systems</td>
<td>129</td>
</tr>
<tr>
<td>MNMF5FX16A</td>
<td>Implement emergency preparedness and response systems</td>
<td>135</td>
</tr>
<tr>
<td>MNMF5FX18A</td>
<td>Apply, monitor, rectify and report statutory / legal compliance</td>
<td>141</td>
</tr>
<tr>
<td>MNMF5FX19A</td>
<td>Apply, monitor and report pit development systems</td>
<td>145</td>
</tr>
<tr>
<td>MNMF5FX20A</td>
<td>Lead and monitor surface mining operations and report outcomes</td>
<td>149</td>
</tr>
<tr>
<td>MNMF5FX21A</td>
<td>Apply and monitor the ventilation management system</td>
<td>159</td>
</tr>
<tr>
<td>MNMF5FX22A</td>
<td>Apply and monitor systems for stable mining</td>
<td>167</td>
</tr>
<tr>
<td>MNMF5FX23A</td>
<td>Apply and monitor mine transport systems and production equipment</td>
<td>173</td>
</tr>
<tr>
<td>MNMF5FX24A</td>
<td>Apply and monitor mine services systems</td>
<td>179</td>
</tr>
<tr>
<td>MNMF5FX25A</td>
<td>Apply and monitor mine fixed plant and infrastructure systems</td>
<td>183</td>
</tr>
<tr>
<td>MNMF5FX26A</td>
<td>Apply and monitor emergency preparedness and response systems</td>
<td>187</td>
</tr>
<tr>
<td>MNMF5FX27A</td>
<td>Facilitate the risk management process</td>
<td>193</td>
</tr>
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</table>
### MNMF5FX01A Implement and maintain statutory / legal compliance systems

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Provide information to site supervisors about statutory/legal compliance and the organisation's policies, procedures and programs.</td>
</tr>
<tr>
<td>1.1.1</td>
<td>Relevant provisions of legislation and codes of practice are accurately and clearly explained to site supervisors.</td>
</tr>
<tr>
<td>1.1.2</td>
<td>Information on the organisation's policies, procedures and programs is provided in a readily accessible manner and is accurately and clearly explained to the work group.</td>
</tr>
<tr>
<td>1.2</td>
<td>Implement and monitor participative arrangements for the management of statutory/legal compliance.</td>
</tr>
<tr>
<td>1.2.1</td>
<td>Organisational procedures for consultation over issues are implemented and monitored to ensure that all members of the work group have the opportunity to contribute.</td>
</tr>
<tr>
<td>1.2.2</td>
<td>Issues raised through consultation are dealt with and resolved promptly or referred to the appropriate personnel for resolution in accordance with workplace procedures.</td>
</tr>
<tr>
<td>1.2.3</td>
<td>The outcomes of consultation over issues are made known to the work group promptly.</td>
</tr>
<tr>
<td>1.3</td>
<td>Implement and monitor the organisation's procedures for identifying potential and existing con-compliance.</td>
</tr>
<tr>
<td>1.3.1</td>
<td>Existing and potential non-compliance in the work area are identified and reported so that assessment and treatment procedures can be applied.</td>
</tr>
<tr>
<td>1.4</td>
<td>Implement and monitor</td>
</tr>
<tr>
<td>1.4.1</td>
<td>Work procedures to treat compliance are</td>
</tr>
<tr>
<td>Section</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>1.4.2</td>
<td>Existing compliance treatment measures are monitored and results reported regularly in accordance with workplace procedures.</td>
</tr>
<tr>
<td>1.4.3</td>
<td>Inadequacies in existing compliance measures are identified and reported to designated personnel.</td>
</tr>
<tr>
<td>1.4.4</td>
<td>Inadequacies in resource allocation for implementation of compliance measures are identified and reported to designated personnel.</td>
</tr>
<tr>
<td>1.5.1</td>
<td>Workplace procedures for dealing with non-compliance events are implemented whenever necessary, to ensure that prompt compliance action is taken.</td>
</tr>
<tr>
<td>1.5.2</td>
<td>Non-compliance events are investigated to identify their cause in accordance with investigation procedures.</td>
</tr>
<tr>
<td>1.5.3</td>
<td>Treatment measures to prevent recurrence and minimise non-compliance are implemented within scope of responsibilities and competencies or alternatively referred to designated personnel for implementation.</td>
</tr>
<tr>
<td>1.6.1</td>
<td>Training needs are identified accurately, specifying gaps between competencies required and those held by work group members.</td>
</tr>
<tr>
<td>1.6.2</td>
<td>Training programs are developed and implemented to identify and fulfil employees' statutory/legal compliance training needs as part of the organisation's general training program.</td>
</tr>
<tr>
<td>1.6.3</td>
<td>Arrangements are made for fulfilling identified statutory/legal compliance training needs in both on and off-the-job training programs in consultation with relevant parties.</td>
</tr>
<tr>
<td>1.7.1</td>
<td>Records for work area are accurately and legibly completed in accordance with workplace legal requirements for the maintenance of records.</td>
</tr>
<tr>
<td>1.7.2</td>
<td>Aggregate information from the area's records is used to identify non-compliance and monitor treatment procedures within work area according to organisational procedures and within scope of</td>
</tr>
</tbody>
</table>
responsibilities and competencies.
RANGE OF VARIABLES

This competency standard is applicable for those with managerial responsibilities. This would typically be as a Metalliferous Mining Manager.

To be exhibited in the work area of responsibility which would typically be a Metalliferous mine site.

Involves application of relevant legislation and codes of practice, and the maintenance of records, provision of information and training and the dealing with committees, statutory/legal agencies and site personnel.

Processes for consultation include committees, consultation with statutory/legal agencies/site representatives, issue resolution procedures and participative/consultative procedures conducted by supervisory staff within the area of managerial responsibility.

Monitoring of activities may include review of written reports, performance appraisal or auditing procedures.

Acts:

Statutory/legal compliance may include but is not limited to

- Trade Practices
- Weights and Measures
- Waterways
- Workers Compensation/Workcover
- Planning and Assessment
- Local Government
- Dangerous Goods
- Minerals and Extractive Industry Licensing
- Industrial Relations
- Navigation
- Mines Act
- Common Law
- Development of Training Policies/Programmes to aid compliance

In accordance with all relevant statutory/legal requirements, particularly:

- Requirements for the maintenance of records for statutory/legal breaches
- Provision of information and training
- regulations and codes of practice relating to statutory/legal compliance
- site representatives and committees
- issue resolution.

Management operates within:

- work schedules may include shift work and varying hours of duty
- environments ranging from simple to complex and diverse
- appropriate policies, guidelines and processes
- a level of autonomy which may range from limited to substantial
quality and continuous improvement processes and standards
business and performance plans
ethical standards established by the organisation
productivity and profitability objectives and targets
best practice and benchmarking principles and practices
legislation, codes and practices
resource parameters which may be defined or negotiated
training and development principles and practices
human resource policies and practices including interviewing, counselling, dispute settling and discipline
financial accountability including profit and loss statements
enterprise/industrial agreements/awards

Management may assume varying roles including:
leader
coach
facilitator
mentor
participant
director
trainer
assessor

Management will typically make decisions to:
maintain statutory/legal Compliance
influence operational performance
plan production schedules
maximise production and minimise operating costs/risks and non-conformances
analyse and review market/production predictions and costs
manage projects and tasks

Resources may include, but are not limited to:
Acts
Legislation/Regulations
Information
Common Law

Negotiations may be with a variety of internal or external sources and be:
formal or informal
short term or ongoing
multi-lingual and cross-cultural
enterprise agreements
legislation regulation compliance
and include relative authorities, project managers, employees, contractors, customers and the community.

Consultation would typically include:
regulatory authorities
- tenderers
- project managers
- contractors
- employees
- community
- customers
- suppliers
EVIDENCE GUIDE

CONTEXT

Competency must be assessed in the normal or simulated work environment within the bounds of safety and in accordance with work procedures.

Assessment shall include those aspects of the core competencies that are consistent with the work environment of this unit.

Guidelines will be in line with statutory/legal requirements, enterprise specific policies and procedures and codes of practice.

CRITICAL ASPECTS AND EVIDENCE

It is essential that competence is fully observed in the critical aspects of:
• Metalliferous mining Operations
• Statutory/legal Compliance
• Procedure/Work Instruction development
• Appraisal and Auditing Procedures
• Acts.

UNDERPINNING KNOWLEDGE

A knowledge of:
• Statutory/legal Control
• Environmental Management
• Work Procedure/Instruction Writing
• Human Resource Management
• Company Policy

UNDERPINNING SKILL

The ability to:
• Develop and maintain statutory/legal and organisational procedures and policies.
• Use effective consultative mechanisms to negotiate processes and procedures appropriate to statutory/legal requirements.
• Explain complex information to superiors/subordinates.
• Provide coaching and mentoring support.
• Read, interpret and apply legislation.

RESOURCE IMPLICATIONS

The resources available will be specific to this competency, the individual employer and the particular worksite as required to comply to the other elements of this unit.

Relevant statutory/legal standards and guidelines relating to Federal, State and Local Government Acts applicable to a Metalliferous mine site.

INTERDEPENDENCE OF UNITS
Interrelationships of units - this unit may need to be applied in conjunction with other relevant units.

COMPETENCY STATEMENT

Competency in this unit needs to be assessed over a period of time to ensure consistency of performance in a range of environments, using a range of assessment instruments.

<table>
<thead>
<tr>
<th>KEY COMPETENCY</th>
<th>LEVEL</th>
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</thead>
<tbody>
<tr>
<td>1 Collecting, Analysing and Organising Information</td>
<td>(3)</td>
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<tr>
<td>2 Communicating Ideas and Information</td>
<td>(3)</td>
</tr>
<tr>
<td>3 Planning and Organising Activities</td>
<td>(3)</td>
</tr>
<tr>
<td>4 Working with Others in Teams</td>
<td>(3)</td>
</tr>
<tr>
<td>5 Using Mathematical Ideas and Techniques</td>
<td>(3)</td>
</tr>
<tr>
<td>6 Solving Problems</td>
<td>(3)</td>
</tr>
<tr>
<td>7 Using Technology</td>
<td>(3)</td>
</tr>
</tbody>
</table>
MNMF5FX02A Implement and maintain pit development systems

**STREAM** F5 Mine Management Services  
**FIELD** FX Mine Management  
**UNIT** MNMF5FX02A Implement and maintain pit development systems

MNMF5FX02A  
This Unit applies in all contexts to planning, implementing and monitoring pit development policies, procedures and practices.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Prepare Site Pit Development Strategy</td>
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<tr>
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<td></td>
<td></td>
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<tr>
<td></td>
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</tr>
<tr>
<td>2.2</td>
<td>Implement Pit Development Strategy</td>
</tr>
<tr>
<td></td>
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<td></td>
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</tr>
<tr>
<td>2.3</td>
<td>Comply with</td>
</tr>
</tbody>
</table>
Occupational Health and Safety/ Environmental Regulations

<table>
<thead>
<tr>
<th>Occupational Health &amp; Safety requirements covering potentially dangerous physical, chemical, noise, air, dust and environmental aspects of extractive material winning, processing and distribution.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.3.2</td>
</tr>
<tr>
<td>2.3.3</td>
</tr>
<tr>
<td>2.3.4</td>
</tr>
<tr>
<td>2.3.5</td>
</tr>
<tr>
<td>2.3.6</td>
</tr>
</tbody>
</table>

2.4 Implement and maintain pit development operational requirements.

| 2.4.1 | Progress plans towards limits of pit development are implemented and checks for maintaining are established. |
| 2.4.2 | Sequential stripping and stockpiling to overall plan is developed and commenced. |
| 2.4.3 | Dewatering is established to plan and schedule requirements. |
| 2.4.4 | Sequential extraction to overall plan is developed and commenced. |
| 2.4.5 | Sequential blending to overall plan is developed and commenced, based on raw feed extraction analysis. |
| 2.4.6 | Sequential rehabilitation plans are developed and commenced. |
| 2.4.7 | Deposition/treatment of tailings is commenced. |
| 2.4.8 | Haul roads are developed to plan. |
| 2.4.9 | Bank stability criteria are informed to all site personnel and measuring plans implemented. |
| 2.4.10 | Sequential blasting plans are developed and blasting criteria are informed to all site personnel and measurement plans implemented. |

2.5 Develop Strategic Plan

| 2.5.1 | Appropriate technology is used to assist project management. |
| 2.5.2 | Relevant stakeholders who have an interest in the plans are informed of the outcomes and the associated implications. |
| 2.5.3 | Feedback mechanisms are established to ensure that the planning process and outcomes are continuously improved. |

RANGE OF VARIABLES
Management operates within:

- an environment ranging from small/medium/large operations
- appropriate policies, guidelines and processes
- established quality and continuous improvement processes
- environmental standards
- ethical standards established by the organisation
- strategic plans developed by the organisation
- productivity and profitability objectives and targets
- international best practice and benchmarking principles and practices
- technical standards established by industry and/or enterprise
- legislation, codes and practices
- resource parameters which may be defined or negotiated
- a diverse range of plant/equipment, products and services
- training and development
- business and performance plans
- enterprise/industrial agreements/awards
- human resource practices and policies
- learning organisation principles and practices.

Management is responsible for but is not limited to:

- evaluating equipment/plant and power requirements for surface mining operations
- preparing a commercially viable project budget
- evaluating, selecting, tendering and purchasing new equipment/plant
- sourcing and raising capital development funding
- planning and monitoring earth work operations
- monitoring project timeframes against budget
- commissioning geophysical, geological assessment programmes
- quantifying resource and proving deposit
- developing detailed site plans and working drawings
- establishing a rehabilitation plan in line with regulative requirements
- establishing and managing positive relations with others in the internal and external environment
- research which could include:
  - geological, geotechnical climatic, hydrology/topography and environmental factors
  - cultural and biological environments
- improve customer relations
- promote company image
- influence operational performance
- plan production schedules
- records/reports
  - oral/written/computer based
- supervision of maintenance

Management must comply with statutory/legal requirements. These may include:

- environmental -noise/air/water
- quantities
- zonings
- boundaries
- processes
• royalties
• rehabilitation
• Mineral Resources or appropriate body
• Occupational Health and Safety Authority
• Federal/State/Local Government
• Harbours and Marine
• Port Authority
• Company policy and procedures
• Title searches including:
  – land ownership
  – council
  – lease
  – by-laws
  – contamination
  – wildlife corridors.

• Planning and development such as:
  – interpreting and communicating information
  – business/performance plans
  – location
  – tender specifications
  – communication liaison/public relations
  – resources
  – statutory/legal/organisational requirements and control
  – resource parameters
  – best practice
  – technical standards established by industry and/or enterprise
  – legal issues/processes
  – planning approvals
  – surveying
  – infrastructure/technology requirements and would typically incorporate the following specifications:
    * products
    * production rate
    * recyclable materials
    * stack emissions
    * hours per week of operation
    * waste and stockpiles
    * water/tailings management
    * transportation systems
    * Occupational Health and Safety/Environmental

all weather dust and noise levels/controls access/haul roads.

**Management interacts/negotiates with but is not limited to:**
• Stakeholders
• regulatory authorities
• tenderers
• operating managers
• project managers
• contractors
• employees
• community
• suppliers
• customers
• State/Federal/Local Government.

Resources may include, but are not limited to:
• People
• buildings/facilities
• finance
• equipment
• power/energy
• technology
• information
• time
• water.

EVIDENCE GUIDE

CONTEXT

Competency must be assessed in the normal or simulated work environment within the bounds of safety and in accordance with work procedures.

Assessment shall include those aspects of the core competencies that are consistent with the work environment of this Unit.

Guidelines will be in line with statutory/legal requirements, enterprise specific policies and procedures and codes of practice.

CRITICAL ASPECTS AND EVIDENCE

It is essential that competence is fully observed in the critical aspects of:
• Resource quantification
• Title research
• Statutory/legal requirements
• Communicating ideas and information
• Report writing
• Tender procedures
• Contract arrangements
• Financial planning
• Mine planning
• Geotechnical interpretation
• Geological interpretation
UNDERPINNING KNOWLEDGE

A knowledge of:
• Surface mining Design
• Statutory/legal Control
• Titles Management
• Organisational Objectives
• Resource Quantification
• Surveying
• Project Management
• Financial Models
• Fundamentals of Contract Law
• Planning and Strategic Management
• Human Resource Policies and Practices
• Industrial Awards/Enterprise Agreements
• Business Planning
• Risk Management
• Customer/Client Relations
• Organisational Change and Development
• Surface mining operations, Plant and Equipment
• Computer Applications
• Negotiation Techniques.

UNDERPINNING SKILLS

The ability to:
• Undertake a feasibility study
• Understand market research and forecast trends/options
• Develop business plans
• Develop resource plans
• Prepare project budgets
• Research titles
• Gain statutory/legal approvals
• Prepare tender specifications
• Negotiate and finalise contracts
• Implement project management strategies
• Implement change
• Access and use appropriate technologies
• Prepare and present management reports
• Negotiate with internal/external customers, community and statutory/legal authorities
• Resolve conflict.

RESOURCE IMPLICATIONS
The resources available will be specific to this competency, the individual employer and the particular worksite as required to comply to the other elements of this unit.

Access to a mine site pit and relevant information relating to implementing and maintaining mine site pit development.

**INTERDEPENDENCE OF UNITS**

Interrelationships of units - this unit may need to be applied in conjunction with other relevant units.

**COMPETENCY STATEMENT**

Competency in this unit needs to be assessed over a period of time to ensure consistency of performance in a range of environments, using a range of assessment instruments.

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<td>3</td>
</tr>
</tbody>
</table>
MNMF5FX03A Implement and maintain surface mining operations

**STREAM**  F5 Mine Management Services  
**FIELD**  FX Mine Management  
**UNIT**  MNMF5FX03A Implement and maintain surface mining operations

This Unit applies in all contexts to the start-up, operation, control and co-ordination of onsite surface mining operations according to approvals and ongoing site constraints.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Initiate recruitment, selecting and training of site supervisors and operators</td>
</tr>
<tr>
<td>3.1.1</td>
<td>Human resource requirements are identified, analysed and documented.</td>
</tr>
<tr>
<td>3.1.2</td>
<td>Position descriptions are developed and implemented in consultation with senior management.</td>
</tr>
<tr>
<td>3.1.3</td>
<td>Selection processes are developed and implemented in consultation with senior management.</td>
</tr>
<tr>
<td>3.1.4</td>
<td>Employees are selected, recruited and inducted within the organisation's human resource policies and procedures.</td>
</tr>
<tr>
<td>3.1.5</td>
<td>Work is organised so that it makes effective use of human resources in achieving the team's and organisation's goals and business plans.</td>
</tr>
<tr>
<td>3.2</td>
<td>Implement delivery of resources and equipment</td>
</tr>
<tr>
<td>3.2.1</td>
<td>Resource and equipment proposals are prepared and presented in accord with the organisation's guidelines and requirements.</td>
</tr>
<tr>
<td>3.2.2</td>
<td>Tender documentation is prepared and contracts let in accord with statutory/legal and organisational guidelines.</td>
</tr>
<tr>
<td>3.2.3</td>
<td>Changes/modifications in the resources plan are negotiated in advance of requirements in accord with organisational guidelines.</td>
</tr>
<tr>
<td>3.3</td>
<td>Initiate site operations according to approvals</td>
</tr>
<tr>
<td>3.3.1</td>
<td>Action plans are prepared which make best use of the available resources, taking into account</td>
</tr>
</tbody>
</table>
and business plans customer needs and organisation policies and procedures that shall include site inductions for all people performing work on-site.

3.3.2 Labour, materials, services and equipment are acquired on time from suppliers in line with accepted organisational practices and procedures.

3.3.3 Systems to survey, assess and review and train site personnel to identify all hazards and implement programs to minimise risks and hazards are developed.

3.4 Initiate establishment of risk management, OH&S, environment and other appropriate systems

3.4.1 Areas of the operation that require compliance with appropriate legislation, site and organisation policies and procedures are identified and interpreted.

3.4.2 Systems using appropriate technology are established to ensure compliance with legislation.

3.4.3 Permit to work systems are developed, implemented and monitored.

3.4.4 All areas of the extractive operation are planned and monitored to ensure compliance with appropriate legislation, site and organisation policies and regulations and Action Plans.

3.4.5 Site safety systems are developed and implemented.

3.5 Maintain Operations

3.5.1 Safe work practices are followed in line with Occupational Health & Safety requirements covering potentially dangerous physical, chemical, noise, air, dust, vibration and environmental aspects of extractive material winning, processing and distribution.

3.5.2 Plant is supervised for adherence to physical safety, operational capability and environmental requirements.

3.5.3 Clearly defined areas of responsibility for monitoring and maintenance of coverage of the operation are allocated to prevent duplication of effort.

3.5.4 Dust and noise levels are monitored and controlled in compliance with statutory/legal requirements, best practice and company requirements.

3.5.5 Review procedures are developed, implemented and updated in line with control measures.

3.6 Initiate pit operation

3.6.1 Pit operations, action plans, based on business plans, organisation's policies and procedures, are
developed and implemented.

3.6.2 Employees are inducted into pit operations.

3.6.3 Operating schedules are developed and implemented.

3.6.4 Appropriate work practices in line with statutory/legal requirements, are applied.

3.6.5 Dust and noise levels are monitored and controlled in compliance with statutory/legal requirements, best practice and company requirements.

3.6.6 Review procedures are developed, implemented and updated in line with control measures.

3.7 Initiate process plant operation

3.7.1 Process plant operations action plans, based on business plan and the organisation's policies and procedures, are developed and implemented.

3.7.2 Employees are inducted into process plant operations.

3.7.3 Operating schedules are developed and implemented.

3.7.4 Appropriate work practices in line with statutory/legal requirements, are applied.

3.7.5 Dust and noise levels are monitored and controlled in compliance with statutory/legal requirements, best practice and company requirements.

3.7.6 Review procedures are developed, implemented and updated in line with control measures.

3.8 Initiate and facilitate quality system

3.8.1 Quality system policies and procedures are analysed and action plans developed.

3.8.2 Quality system requirements are communicated to teams/individuals.

3.8.3 Work performance is documented and the information used to identify opportunities for further improvement of quality.

3.8.4 Recommendations for improving operations are investigated, reported and implemented.

3.8.5 Quality system training is undertaken and mentoring and coaching support provided to individuals/teams.

3.8.6 Opportunities for review of the quality system are designed and implemented.

3.8.7 A climate to improve production and quality is fostered.

3.8.8 Recording/reporting mechanisms are developed and implemented.
| 3.9 | Initiate and facilitate management performance system | 3.9.1 | Management performance system is implemented. |
|     |                                                   | 3.9.2 | Management performance system requirements are communicated to individuals/teams. |
|     |                                                   | 3.9.3 | Work performance is documented and the information used to identify opportunities for further improvement of quality. |
|     |                                                   | 3.9.4 | Recommendations for improving operations are investigated, reported and implemented. |
|     |                                                   | 3.9.5 | Recording/reporting mechanisms are developed and implemented. |
|     |                                                   | 3.9.6 | Mentoring and coaching is provided to assist colleagues in using resources within quality, cost and time standards. |
| 3.10 | Initiate and foster continuous improvement system  | 3.10.1 | Continuous improvement system is implemented. |
|     |                                                   | 3.10.2 | Continuous improvement system requirements are communicated to individuals/teams. |
|     |                                                   | 3.10.3 | A culture, with a focus on improvement, is fostered. |
|     |                                                   | 3.10.4 | Work performance is documented and the information used to identify opportunities for further improvement of quality. |
|     |                                                   | 3.10.5 | Recommendations for improving operations are investigated, reported and implemented. |
|     |                                                   | 3.10.6 | Mentoring and coaching is provided to assist colleagues in using resources within quality, cost and time standards. |
|     |                                                   | 3.10.7 | Recording/reporting mechanisms are developed and implemented. |
|     |                                                   | 3.10.8 | Opportunities for review of the quality system are designed and implemented. |
| 3.11 | Monitor human performance                         | 3.11.1 | Individual and team performance is monitored to ensure that they have the requirements to perform their work to an appropriate standard. |
|     |                                                   | 3.11.2 | Guidance and training support is provided to individuals/teams to develop the appropriate work competencies to achieve individual, team and organisation plans. |
|     |                                                   | 3.11.3 | Feedback is provided to individuals and teams on their work performance. |
| 3.12 | Maintain budget performance                       | 3.12.1 | Financial information is interpreted and analysed to monitor the relationship between budget/forecast/past performance and actual |
performance, profit/loss and market reforecasting.

3.12.2 Operating budgets are prepared and agreed to by management.

3.12.3 Systems using appropriate technology are established to monitor budgets.

3.12.4 Variations in financial performance are identified and action is taken to rectify out of specification results.

5 Recommendations regarding future financial planning are made within the organisation's continuous improvement system.

3.12.6 Cash control and management reports are produced in accord with company/auditors requirements.

3.13 Implement and maintain operational maintenance requirements according to organisation's/statutory/legal bodies' requirements, policies and procedures, manufacturers' documentation and warranty conditions.

3.13.1 Operational maintenance requirements are identified, assessed and implemented.

3.13.2 Maintenance schedules and monitoring systems are established.

3.13.3 Physical resources are maintained within the organisation's policy and practices.

3.13.4 Utilization of physical resources is monitored to ensure that they are being used as planned.

3.13.5 Problems with physical resources are identified, monitored, rectified and recorded in line with risk management policies and procedures.

3.13.6 Alternative methods of using physical resources are analysed, developed and implemented to improve performance.

3.13.7 Waste management methods are used effectively in recycling, waste reduction and waste disposal within organisation and legislative requirements.

3.13.8 Safety, environmental and community impact factors are monitored and reported and acted upon in accord with organisation procedures.

3.13.9 Reports and worksheets are produced in accord with organisation's procedures and requirements.

3.13.10 Regular audits of the operation and maintenance requirements are undertaken, out-of-specification situations identified, rectified and reported accordingly.

RANGE OF VARIABLES

Management operates within:
• work schedules may include shift work and varying hours of duty
• environments ranging from simple to complex and diverse
• appropriate policies, guidelines and processes
• a level of autonomy which may range from limited to substantial
• quality and continuous improvement processes and standards
• business and performance plans
• ethical standards established by the organisation
• productivity and profitability objectives and targets
• best practice and benchmarking principles and practices
• legislation, codes and practices
• resource parameters which may be defined or negotiated
• training and development principles and practices
• a continuous improvement environment
• human resource policies and practices including interviewing, counselling, dispute settling and discipline
• financial accountability including profit and loss statements
• enterprise/industrial agreements/awards.

Management may assume varying roles including:
• leader
• coach
• facilitator
• mentor
• participant
• director
• trainer
• assessor.

Management will typically make decisions to:
• influence operational performance
• plan production schedules
• maximise production and minimise operating costs
• analyse and review market/production predictions and costs
• manage projects and tasks
• co-ordinate resources - human, financial and physical.

Products and services may include:
• rock
• ore concentrate
• mineral sand
• tailings
• overburden
• recyclable materials
• clay/shale
• talc
• river gravels
• salt
• limestone.
Resources may include, but are not limited to:
- people
- finance
- equipment
- water
- buildings/facilities
- technology
- information
- minerals.

MANAGING EQUIPMENT AND MAINTENANCE SYSTEMS

Methods for planning and scheduling maintenance tasks can include:
- flow-charting
- Gantt charts
- critical path networks
- hour meter monitoring.

Evaluation of new and used equipment can be done by such techniques as:
- cost-benefit analysis
- pay-back period
- discounted cash flow and nett present value
- comparison operation.

Methods of identifying spare parts and consumables can include:
- diagrams in makers handbooks and other documents
- lists in makers handbooks and other documents or by electronically generated means
- labels, bar codes etc. on items.

Methods of maintaining appropriate spare part stock levels which can include:
- two bin system
- re-order level system
- re-order cycle system
- any of the above operating with computer assistance
- replenishment system
- just in time or regular purchasing.

CONTROL COSTS

Cost information can be obtained from these and other sources:
- time sheets
- order and log books
- invoices
- requisitions
- repairs & maintenance records
- fuel consumption records
• production throughput
• equipment performance history.

Clients may be internal or external and drawn from:
• existing clients of the organisation
• sources new to the organisation

Negotiations may be with a variety of internal or external sources and be:
• formal or informal
• short term or ongoing
• multi-lingual and cross-cultural
• enterprise agreements
  and include relative authorities, tenderers, suppliers, project managers, employees, contractors,
  customers and the community.

Industrial Relations regulations and procedures can include:
• Awards
• Enterprise Agreements or Contracts
• Organisation's HR and IR issues.

Audits of the organisation's performance may include:
• finance
• energy
• safety
• environment
• Quality Assurance
• HR performance
• Legislation Regulation Compliance
• Benchmarking.

The delivery and maintenance of products and services may involve:
• ISO, AS and NATA accreditation processes and procedures
• client needs
• strategic goals of the organisation
• ethical practices in conducting business
• best practice established in the extractive industries
• resource parameters.

Supervision of maintenance could include:
• tradespeople and contractors
• mobile equipment and fixed plant.

Traffic management can include:
• the use of development drives and openings
• exit and entrance roads
• signage
• windrows
• designated areas
• sentry and security systems.
Management would interact with:
- operators
- maintenance personnel
- peers
- contractors
- suppliers
- consultants
- relevant stakeholders
- senior management
- customers
- community groups
- statutory/legal authority representatives.

Legislative compliance may include, but is not limited to:
- Mines Department/Mineral Resources or appropriate body
- Occupational Health & Safety Authority
- Environmental Authority
- State/Federal/Local Government authorities
- Dangerous Goods.

Consultation would typically include:
- regulatory authorities
- tenderers
- project managers
- contractors
- employees
- community
- customers
- suppliers.

Metalliferous mining plant and equipment may include, but is not limited to:

**MOBILE PLANT**
- Front End Loader
- Excavator
- Dozer
- Grader
- Dumptruck
- Scraper
- Dragline
- Bobcat
- Drill jumbo
- Bogger
- Roller
- Watercart
- Service/Maintenance Vehicle
- Drill
- Compressor
- Generator
• Crane
• Truck/Hiab
• Backhoe
• Face Shovel
• Barge
• Dredge
• Cherry Picker
• Tractor
• Bucket wheel excavator
• Surface Miner

**FIXED PLANT**

**CRUSHERS:**
• Jaw
• Gyratory
• Vert Shaft Impactor
• Cone
• Impactor/Hammermill
• Rolls
• Ball
• Autogenous
• Attrition
• Rod

**SCREENS:**
• Dewatering
• Trommel
• Harpwire
• Vibratory
• Inclined/horizontal
• Morganson Sizer
• Grizzly - Static
• Grizzly - Live
• Divergator
• Banana (sieve bend)

**CONVEYORS:**
• Stackers
• Bucket
• Chevron
• Screw
• Belt
• Overland - Track Shiftable

**FEEDERS:**
• Vibrating
• Belt
• Track/Caterpillar
• Apron
• Weigh belt
• Reclaim systems
• Reciprocating Plate

SAND & THICKENERS
• Cyclones
• Classifiers
• C.I.P
• Jigs and Tables
• Gravity Plant
• Flotation
• Spirals

FINES PROCESSING
• Screw
• Tubs
• Scrubber
• Log Washer
• Thickener
• Filter Press
• Clarifier
• Heavy Media

ANCILLARY EQUIPMENT
• Bins
• Compressor
• Hoppers
• Silos
• Pumps
• Valves
• Walkways
• Electric Motors
• Generators
• Welders
• Ladders
• Stairways
• Hydraulic Units
• Control Rooms
• Dust extractor
• Substation
• Transformer
• Dust Suppression
• Lighting
• Dust extraction

BUILDINGS
• Weighbridge
• Offices
• Workshop
• Amenities

• Explosives magazines
• Ammonium nitrate store
• Fuel storage
• Oil store
• Cyanide store
• Hazardous goods store
• Laboratory
• Ablutions
• Change room
• First aid

INFRA-STRUCTURE
• Roads
• Dams
• Settling Ponds
• Tanks
• Bund walls
• Tailings Dams
• Overburden Dump
• Ore stockpiles
• Fencing
• Fire fighting equipment
• Car park
• Communications
• Power Supply

EVIDENCE GUIDE

CONTEXT

Competency shall be assessed in the normal or simulated work environment within the bounds of safety and in accordance with work procedures.

Assessment shall include those aspects of the core competencies that are consistent with the work environment of this Unit.

Guidelines will be in line with statutory/legal requirements, enterprise specific policies and procedures and codes of practice.

CRITICAL ASPECTS AND EVIDENCE

It is essential that competence is fully observed in the critical aspects of:
• Strategic planning
• Metalliferous mining operations
• Resource quantification
• Human resource management
• Statutory/legal requirements
• Communicating ideas and information
• Management reporting
• Tender procedures
• Contract arrangements
• Financial planning
• Company Products and Services
• Customer Relations
• Environmental Management
• Management Styles and systems
• Continuous Improvement Process.
UNDERPINNING KNOWLEDGE

A knowledge of:
- Metalliferous mining Operations
- Metalliferous mining Products and Services
- Metalliferous mining Plant and Equipment
- Team Management
- Quality System
- Statutory/legal Control
- Organisational Objectives
- Resource Quantification
- Surveying
- Financial Models
- Fundamentals of Contract Law
- Industrial Awards/Enterprise Agreements
- Business Planning
- Risk Management: Principles, Strategies and Applications
- Customer/Client Relations
- Organisational Change and Development
- Environmental Management
- Occupational Health and Safety
- Computer Applications
- Negotiation Techniques
- Statistics.

UNDERPINNING SKILLS

The ability to:
- Monitor and maintain surface mining operations
- Manage people and processes
- Prepare capital equipment proposals
- Develop business plans
- Develop resource plans
- Prepare operating budgets and forecast trends
- Analyse and review market/production predictions and costs
- Manage projects and tasks
- Co-ordinate resources - human, financial and physical
- Deliver and maintain products and services to required specifications
- Manage surface mining traffic
- Manage equipment and maintenance systems
- Evaluate new and used equipment using appropriate techniques
- Control operating costs
- Audit the surface mining performance: finance, energy, safety, environment, quality assurance, HR, legislative compliance and benchmarking
- Gain statutory/legal approvals
- Prepare tender specifications
- Negotiate and finalise contracts
- Implement change
- Access and use appropriate technologies
- Prepare and present management reports
- Negotiate with internal/external customers, community and statutory/legal authorities
- Resolve conflict

**RESOURCE IMPLICATIONS**
The resources available will be specific to this competency, the individual employer and the particular worksite as required to comply to the other elements of this unit.

Access to a Metalliferous surface mining operation.

**INTERDEPENDENCE OF UNITS**
Interrelationships of units - this unit may need to be applied in conjunction with other relevant units.

**COMPETENCY STATEMENT**
Competency in this unit needs to be assessed over a period of time to ensure consistency of performance in a range of environments, using a range of assessment instruments.

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</table>
MNMF5FX04A Select and commission surface mining plant and equipment

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<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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<tbody>
<tr>
<td>4.1</td>
<td>Identify and Research Organisation's Needs</td>
</tr>
<tr>
<td></td>
<td>4.1.2 Environments are investigated and analysed, to develop options, strategies and anticipated outcomes.</td>
</tr>
<tr>
<td></td>
<td>4.1.3 Research brief clearly states the objectives and outcomes, and the requirements for presentation of information.</td>
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<tr>
<td></td>
<td>4.1.4 Strategies which translate the objectives into the planning process are developed and implemented.</td>
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<tr>
<td></td>
<td>4.1.5 Existing system and equipment suitability is evaluated, taking into account operational requirements, and occupational health and safety and environmental legislation/regulations.</td>
</tr>
<tr>
<td></td>
<td>4.1.6 New systems are researched, evaluated, selected and purchased, in line with operational and budget requirements, occupational health and safety and environmental legislation/regulations.</td>
</tr>
<tr>
<td></td>
<td>4.1.7 Research information is analysed and interpreted to establish options and opportunities.</td>
</tr>
<tr>
<td>2</td>
<td>Prepare Business Plans/ Budgets</td>
</tr>
<tr>
<td></td>
<td>4.2.2 Business plans/budgets including contingency plans are prepared and presented in accord with the organisation's guidelines and requirements.</td>
</tr>
<tr>
<td></td>
<td>4.2.3 Plans contain a clear statement of priorities and schedules.</td>
</tr>
</tbody>
</table>
4.2.4 Contingency plans provide optional strategies in the event that the full resource requirement is not secured.

4.2.5 Resource implications of the plans are identified and strategies are devised for their acquisition and use.

4.2.6 Installation plans and schedules are developed in line with operational requirements and agreed to by all stakeholders.

4.3 Communicate the Outcomes of the Planning Process

4.3.1 Stakeholders who have an interest in the plans are informed of the outcomes and the associated implications.

4.3.2 Potential suppliers and contractors are selected.

3 Feedback mechanisms are established to ensure that the planning process and outcomes are continuously improved.

4.4 Install Processing Equipment

4.4.1 Installation plans and schedules are confirmed.

4.4.2 Contractors are consulted and informed of installation requirements.

4.4.3 Meetings are held with employees and roles/responsibilities are understood.

4.4.4 Standard operating procedures/work instructions are developed in line with operating manuals.

4.4.5 Operational staff are trained on new equipment and processes.

4.4.6 Safety and environmental rules and regulations, including site rules/instructions and legislation/regulations are understood and complied with.

4.4.7 Installation is monitored and meetings held to resolve issues.

4.4.8 Installation costs are monitored against budget and anomalies identified and rectified.

4.4.9 Equipment/process integrity is tested against production requirements, problems are identified and rectified in consultation with stakeholders.

4.4.10 Strategies and reporting mechanisms are developed for ongoing monitoring of equipment performance.

4.4.11 Installation records/reports are maintained for retention and forwarded to appropriate personnel.
RANGE OF VARIABLES

Management operates within:
- an environment ranging from small/medium/large operations
- appropriate policies, guidelines and processes
- established quality and continuous improvement processes
- environmental standards
- ethical standards established by the organisation
- strategic plans developed by the organisation
- productivity and profitability objectives and targets
- international best practice and benchmarking principles and practices
- technical standards established by industry and/or enterprise
- legislation, codes and practices
- resource parameters which may be defined or negotiated
- a diverse range of plant/equipment, products and services
- training and development
- business and performance plans
- enterprise/industrial agreements/awards
- human resource practices and policies
- learning organisation principles and practices

Management is responsible for but is not limited to:
- evaluating equipment/plant and power requirements for surface mining operations
- preparing a commercial viable project budget
- evaluating, selecting, tendering and purchasing new equipment/plant
- sourcing and raising capital development funding
- planning and monitoring earth work operations
- monitoring project timeframes against budget
- commissioning geophysical surveys
- quantifying resource and proving deposit
- developing detailed site plans and working drawings
- establishing a rehabilitation plan in line with regulative requirements
- establishing and managing positive relations with others in the internal and external environment
- research which could include:
  - geological, climatic, hydrology/topography and environmental factors
  - cultural and biological environments
- improve customer relations
- promote company image
- influence operational performance
- plan production schedules
- records/reports
  - oral/written/computer based
- supervision of maintenance.

Management must comply with statutory/legal requirements this may include:
- environmental -noise/air/water
- quantities
- zonings
- boundaries
- processes
- royalties
- rehabilitation
- freehold
- council
- lease
- by-laws
- contamination
- wildlife corridors
- Mineral Resources or appropriate body
- Occupational Health and Safety Authority
- Environmental
- Local Government
- Harbours and Marine
- Port Authority
- Company policy and procedures

Planning and development would typically include:
- interpreting and communicating information
- surveying
- infrastructure/technology requirements and would typically incorporate the following specifications:
  * products
  * production rate
  * recyclable materials
  * stack emissions
  * hours per week of operation
  * waste and stockpiles
  * water/tailings management
  * transportation systems.

- All weather access/haul roads.

**Management interacts/negotiates with but is not limited to:**
- stakeholders
- regulatory authorities
- tenderers
- operating managers
- project managers
- contractors
- employees
- community
- suppliers
- customers.

**Resources may include, but are not limited to:**
- people
- buildings/facilities
Metalliferous mining plant and equipment may include but is not limited to:

**Mobile**
- Front end loader
- Bogger
- Excavator
- Dozer
- Grader
- Dumptruck
- Scraper
- Dragline
- Bobcat
- Roller/Compactor
- Watercart
- Service/Maintenance Vehicle
- Drill jumbo
- Compressor
- Generator
- Crane
- Truck/Hiab
- Backhoe
- Face Shovel
- Barge
- Dredge
- Cherry picker
- Tractor
- Bucketwheel/Excavator
- Surface Miner

**Fixed**

**Crushers:**
- Jaw
- Gyratory
- Vert Shaft Impactor
- Cone
- Impactor/Hammermill
- Rolls
- Ball
- Autogenous
- Attrition
- Rod
**Screens:**
- Dewatering
- Trommel
- Harpwire
- Vibratory
- Inclined/horizontal
- Morganson Sizer
- Grizzly - static
- Grizzly - live
- Divergator
- Banana (sieve bend)
- Pep Screen

**Conveyors:**
- Stackers
- Bucket
- Chevron
- Screw
- Belt
- Overland - track shiftable

**Feeders:**
- Vibrating
- Belt
- Track/caterpillar
- Apron
- Weigh belt

**Fixed Sand & Fines Processing:**
- Flotation
- C.I.P.
- Heavy media
- Jigs and tables
- Gravity plant
- Spirals
- Thickeners
- Cyclones
- Classifiers
- Screw
- Tubs
- Scrubber
- Log washer
- Filter Press
- Clarifier

**Blending equipment:**
- Pugmill
- Precoat plant
- Stabilising plant
Ancillary equipment:
Bins, compressor
Hoppers
Silos
Pumps
Pipes
Valves
Walkways
Electric motors
Generators
Welders
Ladders
Stairways
Hydraulic units
Control rooms
Dust extractor
Substation
Transformer
Dust suppression
Lighting
Dust extraction

Evaluation of new and used equipment can be done by such techniques as:
- cost-benefit analysis
- pay-back period
- discounted cash flow and nett present value
- comparison drilling - parallel twisting of drilling equipment.

Methods of identifying spare parts and consumables which can include:
- diagrams in makers handbooks and other documents
- lists in makers handbooks and other documents
- labels, bar codes on items.

Methods of maintaining appropriate spare parts stock levels which can include:
- two bin system
- re-order level system
- re-order cycle system
- any of the above operating with computer assistance
- replenishment system
- just in time or regular purchasing.

CONTROL COSTS

Cost information can be obtained from these and other sources:
- time sheets
- order and log books
- invoices
- requisitions
- repairs & maintenance records
• fuel consumption records
• production throughput
• machine performance history.

EVIDENCE GUIDE

CONTEXT

Competency must be assessed in the normal or simulated work environment within the bounds of safety and in accordance with work procedures.

Assessment shall include those aspects of the core competencies that are consistent with the work environment of this Unit.

Guidelines will be in line with statutory/legal requirements, enterprise specific policies and procedures and codes of practice.

CRITICAL ASPECTS AND EVIDENCE

It is essential that competence is fully observed in the critical aspects of:
• Metalliferous mining operations
• Metalliferous mining Plant and Equipment Business Planning
• Human resource management
• Statutory/legal requirements
• Communicating ideas and information
• Management reporting
• Tender procedures
• Contract arrangements
• Financial planning
• Company products and services
• Customer relations
• Environmental management
• Management styles and systems
• Continuous improvement processes.

UNDERPINNING KNOWLEDGE

A knowledge of:

• Metalliferous mining Operations
• Metalliferous mining Products and Services
• Metalliferous mining Plant and Equipment
• Team Management
• Quality System
• Statutory/legal Control
• Organisational Objectives
• Resource Quantification
• Surveying
• Financial Models
- Fundamentals of Contract Law
- Industrial Awards/Enterprise Agreements
- Business Planning
- Risk Management: Principles, Strategies and Applications
- Customer/Client Relations
- Organisational Change and Development
- Environmental Management
- Occupational Health and Safety
- Computer Applications
- Negotiation Techniques.

**UNDERPINNING SKILLS**

The ability to:
- Monitor and Maintain Metalliferous Mining Plant and Equipment
- Manage people and processes
- Prepare Capital Equipment Proposals
- Develop business plans
- Prepare operating budgets and forecast trends
- Analyse and review production costs versus equipment/plant operating costs
- Manage projects and tasks
- Co-ordinate resources - human, financial and physical
- Commission Plant
- Manage equipment and maintenance systems
- Evaluate new and used equipment using appropriate techniques
- Control operating costs
- Gain statutory/legal approvals
- Prepare tender specifications
- Negotiate and finalise contracts
- Implement change
- Access and use appropriate technologies
- Prepare and present management reports
- Negotiate with internal/external customers, community and statutory/legal authorities
- Resolve conflict.

**RESOURCE IMPLICATIONS**

The resources available will be specific to this competency, the individual employer and the particular worksite as required to comply to the other elements of this unit.

Access to a Metalliferous mine replacing and commission plant and equipment.

**INTERDEPENDENCE OF UNITS**

Interrelationships of units - this unit may need to be applied in conjunction with other relevant units.

**COMPETENCY STATEMENT**
Competency in this unit needs to be assessed over a period of time to ensure consistency of performance in a range of environments, using a range of assessment instruments.

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### MNMF5FX05A Plan, conduct and oversee drilling operations

**STREAM**  F5 Mine Management Services  
**FIELD**  FX Mine Management  
**UNIT**  MNMF5FX05A Plan, conduct and oversee drilling operations

**MNMF5FX05A**  
This Unit applies in all contexts to drilling operations applicable to the Metalliferous mining sector or drilling contractors used for greenfield sites.

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| 5.1 Evaluate drilling techniques and options. | 5.1.1 Drilling methods and accessories are evaluated to match various engineering and Metalliferous mining applications relevant to specific site and customer demands.  
5.1.2 Economics and efficiency of the various drilling methods are evaluated.  
5.1.3 Plan is developed for absorbing peak loads and breakdowns in drilling operations when designing the Metalliferous mine site and its stage development.  
5.1.4 Drilling programs relative to geological site conditions and environmental constraints are optimised.  
5.1.5 Capability and resulting work of the driller and its effect on production costs is recognised.  
5.1.6 Appropriate equipment for blast hole drilling that best matches production requirements is evaluated and selected.  
5.1.7 Properties and characteristics of the geological deposit are evaluated.  
5.1.8 An appropriate operational and recording system is developed.  
5.1.9 Selection of contract drillers is undertaken in accordance with company policies/statutory/legal requirements. |
| 5.2 Maintain Drilling Equipment | 5.2.1 Repair and maintenance works schedules are planned and allocated.  
5.2.2 Faults are recorded and repairs are carried out in |
<table>
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<tr>
<th>Section</th>
<th>Description</th>
</tr>
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<tr>
<td>5.2.3</td>
<td>Reports and worksheets are produced using appropriate technology in accord with company procedures and requirements.</td>
</tr>
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</table>

| 5.3 Design and plan drilling program. | 5.3.1 Drill program is designed based on Metalliferous mining production rates, geological/site/environmental factors, drill hole layout, drill bit/rod life, drill penetration rate and drill hole deviation. |
| 5.3.2 | Operator safety training programs are developed and administered. |
| 5.3.3 | Work schedules are planned and organised and tasks allocated. |
| 5.3.4 | Transportation and movement of the rig around the specific site is planned. |
| 5.3.5 | Drilling personnel are motivated to be vigilant and to reinforce safe attitudes and work practices. |
| 5.3.6 | Type and size of drilling equipment is matched with blasting program overall operation and production and environmental constraints. |
| 5.3.7 | Drill pattern using acceptable survey technique is confirmed. |

| 5.4 Cost drilling operations | 5.4.1 Operational costs are determined to enterprise requirements. |
| 5.4.2 | Capital costs are determined to enterprise requirements. |
| 5.4.3 | Ownership costs of drilling equipment is calculated. |
| 5.4.4 | Operating costs of drilling equipment is calculated. |
| 5.4.5 | Consumable cost of drilling is calculated. |
| 5.4.6 | Total unit costs of a drilling operation is calculated. |

| 5.5 Optimise drill performances | 5.5.1 Fault finding and repairs is carried out on all systems as required. |
| 5.5.2 | Daily routine maintenance procedures are established and maintained. |
5.5.3 Drill performance and utilisation is monitored and analysed.

5.5.4 Monitoring procedures are carried out to suppliers and company specifications.

5.5.5 Operators are instructed on the outcomes required from the drilling operation.

5.5.6 Suggestions are encouraged, recorded and actioned to improve performance and efficiency of operation.

5.5.7 Options are investigated for the improvement of drill performance including, but not limited to, consumable items, drilling techniques, drill patterns.

RANGE OF VARIABLES

Management operates within:
- an environment ranging from small/medium/large operations
- appropriate policies, guidelines and processes
- established quality and continuous improvement processes
- environmental standards
- ethical standards established by the organisation
- strategic plans developed by the organisation
- productivity and profitability objectives and targets
- international best practice and benchmarking principles and practices
- technical standards established by industry and/or enterprise
- legislation, codes and practices
- resource parameters which may be defined or negotiated
- a diverse range of plant/equipment, products and services
- training and development
- business and performance plans
- enterprise/industrial agreements/awards
- human resource practices and policies
- learning organisation principles and practices.

Management is responsible for but is not limited to:
- evaluating equipment/plant and power requirements for surface mining operations
- preparing a commercial viable project budget
- evaluating, selecting, tendering and purchasing new equipment/plant
- sourcing and raising capital development funding
- planning and monitoring earth work operations
- monitoring project timeframes against budget
- commissioning geophysical surveys
- quantifying resource and proving deposit
- developing detailed site plans and working drawings
• establishing a rehabilitation plan in line with regulative requirements
• establishing and managing positive relations with others in the internal and external environment
• research which could include:
  – geological, climatic, hydrology/topography and environmental factors
  – cultural and biological environments
• improve customer relations
• promote company image
• influence operational performance
• plan production schedules
• records/reports
  – oral/written/computer based
• supervision of maintenance.

Operator safety training programs may include but are not limited to:
• hazards and potential accidents
• driller's personal safety equipment
• accident investigation and reporting
• location
• personal behaviour
• drilling operation
• noise and dust
• responsibility of key personnel
• associated legislation and regulations.

COST DRILLING OPERATIONS

Calculation of operational costs may include, but is not limited to:
• Ownership costs of drilling equipment
• Operating costs of drilling equipment
• Consumable cost of drilling
• Total unit costs of a drilling operation.

DEVELOP DRILLING PLAN

Scope of work may include, but is not limited to:
• tendering/quoting
• site inspections
• operator training
• purchase/acquisition of equipment.

Features of site and methods of access can be determined by various methods including:
• geological and topographical maps
• air photos
• site inspection, (foot, 2 or 4-wheel drive)
• survey/profiling
• underground plans of workings.

Influence of weather conditions:
• small shots to process rig and stay free.
Hazards that may affect planning at a drilling site include:
- bench slope and stability formation
- proximity of other operating equipment
- competency of underground openings

Estimating data and methods can include:
- checklists of all activities and material
- wastage factors
- contingency allowances
- schedules of quantities and rates
- organisation's procedures for calculating and presenting estimates
- inspection of cores or chip samples from earlier drilling programs.

Equipment and methods that may be used in a drilling program include:
- Auger
  - Solid flight
- Rotary air
  - down hole hammer
  - rotary air blast
  - top hole hammer
- Hydraulic

Equipment for drilling site can include:
- Drill rigs:
  - Drifter - Hydraulic or pneumatic
  - Rotary top drive
- Ancillary equipment
  - Pumps
  - Compressors
  - Generators
  - Grout Mixing Equipment
    - Diesel Engines
- Vehicles
  - Downhole tools such as Tri-cone, button or cross bits.

Potential hazards to health and safety at a drilling site, can include:
• faults in mechanical, electrical, hydraulic or other equipment
• hazards related to drilling eg.: explosion, drilling into butts, misfires
• drill rod handling
• power lines
• chemicals
• care in used rod disposal
• contaminants
• toxic materials and gases
• heat stress
• climatic exposure
• human error
• lack of training
• poor site preparation
• non-use safety gear
• ground slippage and geology
• noise and dust
• face stability
• loose fitting clothing
• bull hose.

Warning signals and related controls include:
• signs
• barriers
• audible regulatory compliance.

MANAGE EQUIPMENT MAINTENANCE

Methods for planning and scheduling maintenance tasks can include but are not limited to:
• flow-charting
• Gantt charts
• critical path networks.

Evaluation of new and used equipment can be done by such techniques as but is not limited to:
• cost-benefit analysis
• pay-back period
• discounted cash flow and nett present value
• comparison drilling - parallel twisting of drilling equipment.

Methods of identifying spare parts and consumables which can include but are not limited to:
• diagrams in makers handbooks and other documents
• lists in makers handbooks and other documents
• labels, bar codes etc. on items.

Methods of maintaining appropriate stock levels which can include but are not limited to:
• two bin system
• re-order level system
• re-order cycle system
• any of the above operating with computer assistance
• replenishment system

EVIDENCE GUIDE

CONTEXT
Competency must be assessed in the normal or simulated work environment within the bounds of safety and in accordance with work procedures.

Assessment shall include those aspects of the core competencies that are consistent with the work environment of this Unit.

Guidelines will be in line with statutory/legal requirements, enterprise specific policies and procedures and codes of practice.

CRITICAL ASPECTS AND EVIDENCE

It is essential that competence is fully observed in the critical aspects of:
• Evaluate drilling techniques and options
• Manage drilling operations
• Business Planning
• Plan drilling on-site
• Human resource management
• Manage equipment maintenance
• Statutory requirements
• Communicating ideas and information
• Management reporting
• Tender procedures
• Contract arrangements
• Financial planning
• Customer relations
• Environmental management
• Management styles and systems
• Continuous improvement processes

UNDERPINNING KNOWLEDGE

A knowledge of:
• Drilling Operations
• Drilling Products and Services
• Drilling Plant and Equipment
• Team Management
• Quality System
• Statutory Control
• Organisational Objectives
• Resource Monitoring
• Surveying
• Financial Models
• Fundamentals of Contract Law
- Human Resource Management
- Industrial Awards/Enterprise Agreements
- Planning Processes
- Risk Management: Principles, Strategies and Applications
- Customer/Client Relations
- Environmental Management
- Occupational Health and Safety
- Computer Applications
- Negotiation Techniques
- Plan Presentation.

**UNDERPINNING SKILLS**

**The ability to:**

- Monitor and Maintain Drilling Operations
- Manage people and processes
- Develop operating plans
- Prepare operating budgets and forecast trends
- Manage projects and tasks
- Co-ordinate resources - human, financial and physical
- Deliver and maintain products and services to required specifications
- Manage drilling traffic
- Manage equipment and maintenance systems
- Evaluate new and used equipment using appropriate techniques
- Control operating costs
- Audit drilling performance - finance, energy, safety, environment, quality assurance, HR, legislative compliance and benchmarking
- Gain statutory/legal approvals
- Prepare tender specifications
- Negotiate and finalise contracts
- Access and use appropriate technologies
- Prepare and present management reports
- Negotiate with internal/external customers, community and statutory/legal authorities
- Resolve conflict
- Read, analyse and update plans
- Carry out survey

**RESOURCE IMPLICATIONS**

The resources available will be specific to this competency, the individual employer and the particular worksite as required to comply to the other elements of this unit.

Access to a Metalliferous surface mine using drilling operations.

**INTERDEPENDENCE OF UNITS**

Interrelationships of units - this unit may need to be applied in conjunction with other relevant units.
COMPETENCY STATEMENT

Competency in this unit needs to be assessed over a period of time to ensure consistency of performance in a range of environments, using a range of assessment instruments.

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</table>
## MNMF5FX06A Manage blasting operations

**STREAM**  F5 Mine Management Services  
**FIELD**  FX Mine Management  
**UNIT**  MNMF5FX06A Manage blasting operations

This Unit applies in all contexts to blasting operations.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 6.1 Evaluate Blasting Techniques and Options | 6.1.1 Blasting methods and accessories are evaluated to match site specific requirements.  
6.1.2 Economics and efficiency of blast methods is evaluated.  
6.1.3 Blasting schedule is planned and organised with site personnel.  
6.1.4 Blasting programs relative to geological site conditions and characteristics are evaluated and optimised.  
6.1.5 Capability and resulting work of the shotfirer and its effect on production costs is recognised.  
6.1.6 Most appropriate blasting method for a set of circumstances is recognised.  
6.1.7 Appropriate equipment for blasting that best matches requirements is evaluated and selected. |
| 6.2 Select appropriate blasting technique. | 6.2.1 Blasting materials and techniques are planned and selected to match rock properties, degree of breakage required, environmental consideration etc.  
6.2.2 Safe blasting procedures are designed for site to comply with company & statutory/legal requirements.  
6.2.3 Blast is designed to minimise environmental effects and optimise performance.  
6.2.4 Monitoring system is employed.  
6.2.5 Appropriate storage, transportation and handling methods for explosives are selected and used in accordance with statutory/legal requirements and |
6.3 Monitor and evaluate blast performance.

6.3.1 Blast performance is monitored, recorded and evaluated.

6.3.2 Economics and efficiency of the production blast is evaluated.

6.4 Plan, organise and supervise other operations associated with blasting

6.4.1 Blast schedules are planned and organised.

6.4.2 Use and storage of explosive materials is monitored.

6.4.3 Safety and accident prevention policies are applied in line with Occupational Health and Safety and statutory/legal regulations.

6.4.4 Operators are instructed on the outcomes required from drilling and blasting operations.

6.4.5 Procedures are carried out to suppliers and company specifications.

6.4.6 Routine inspection & maintenance procedures of blasting equipment are established.

6.4.7 Regulations, duties and responsibilities of a shotfirer are identified.

6.4.8 Shot charging and firing is monitored against plan.

6.4.9 Correct procedures for dealing with misfires is followed.

6.4.10 Blasting records are maintained in accordance with legislative/company requirements.

RANGE OF VARIABLES

Management is responsible for but is not limited to:
- evaluating equipment/plant and power requirements for Metalliferous mining operations
- preparing a commercial viable project budget
- evaluating, selecting, tendering and purchasing new equipment/plant
- sourcing and raising capital development funding
- planning and monitoring earth work operations
- monitoring project timeframes against budget
- commissioning geophysical surveys
- quantifying resource and proving deposit
- developing detailed site plans and working drawings
- establishing a rehabilitation plan in line with regulative requirements
• establishing and managing positive relations with others in the internal and external environment
• research which could include:
  − geological, climatic, hydrology/topography and environmental factors
  − cultural and biological environments
• improve customer relations
• promote company image
• influence operational performance
• plan production schedules
• records/reports
  − oral/written/computer based
• supervision of maintenance
• blasting schedules in accordance with statutory/legal regulations are in place and adhered to
• site conditions may require differing methods of initiation (weather, winds storms etc.)
• geological factors may need to be considered in blast design, initiation systems and environment compliance
• geographic location of site in relation to neighbours may affect blast design
• alternate explosives types and availability may affect blast design
• surface delay and ignition sources
• blasting licences and permits
• blast design
• laser profiling
• bore hole tracking
• interpreting and communicating information
• pursuing optimum performance in blasting operations
• monitoring/videoing blasting practice for safety and other considerations

Compliance will be in line with statutory and legal requirements.

Consultation would typically include:
• regulatory authorities
• contractors
• employees
• customers
• community

Resources may include, but are not limited to:
• people
• equipment
• storage magazines
• power/energy
• technology
• information

MANAGE EQUIPMENT MAINTENANCE

Methods for planning and scheduling maintenance tasks can include:
• flow-charting
• Gantt charts
• critical path networks

**Evaluation of new and used equipment can be down by such techniques as:**
• cost-benefit analysis
• pay-back period
• discounted cash flow and nett present value
• comparison drilling - parallel twisting of drilling equipment

**Methods of identifying spare parts and consumables which can include:**
• diagrams in makers handbooks and other documents
• lists in makers handbooks and other documents
• labels, bar codes etc. on items

**Methods of maintaining appropriate stock levels which can include:**
• two bin system
• re-order level system
• re-order cycle system
• any of the above operating with computer assistance
• replenishment system

**CONTROL COSTS**

**Cost information can be obtained from these and other sources:**
• time sheets
• log books
• invoices
• requisitions
• repairs & maintenance records
• explosives consumption records

**EVIDENCE GUIDE**

**CONTEXT**

Competency must be assessed in the normal or simulated work environment within the bounds of safety and in accordance with work procedures.

Assessment shall include those aspects of the core competencies that are consistent with the work environment of this Unit.

Guidelines will be in line with statutory/legal requirements, enterprise specific policies and procedures and codes of practice.

**CRITICAL ASPECTS AND EVIDENCE**
It is essential that competence is fully observed in the critical aspects of:

- Plan/Design blasting operations
- Select appropriate blasting techniques
- Monitor and evaluate blast performance
- Monitor integrity of underground opening
- Rock mechanics
- Human resource management
- Statutory/legal requirements
- Communicating ideas and information
- Management reporting
- Tender procedures
- Contract arrangements
- Financial management
- Occupational Health and Safety Systems
- Company products and services
- Customer relations
- Environmental management
- Management styles and systems
- Continuous improvement processes

UNDERPINNING KNOWLEDGE

A knowledge of:

- Blasting Operations
- Metalliferous Mining Products and Services
- Drilling Plant and Equipment
- Team Management
- Quality System
- Statutory Control
- Blasting Plans
- Resource Monitoring
- Surveying
- Team Management Techniques
- Industrial Awards/Enterprise Agreements
- Risk Management: Principles, Strategies and Applications
- Blasting products, storage and delivery systems
- Customer/Client Relations
- Environmental Management
- Occupational Health and Safety
- Computer Applications
- Negotiation Techniques

UNDERPINNING SKILLS

The ability to:

- Monitor and Maintain Blasting Operations
• Manage people and processes
• Prepare Drilling and Blasting Proposals
• Prepare operating budgets
• Analyse and review blasting operations
• Manage projects and tasks
• Co-ordinate resources - human, financial and physical
• Deliver and maintain products and services to required specifications
• Manage surface mining traffic
• Manage equipment and maintenance systems
• Evaluate new and used equipment using appropriate techniques
• Control operating costs
• Audit blasting performance - safety, environmental, statutory/legal compliance
• Gain statutory/legal approvals
• Negotiate and finalise contracts
• Access and use appropriate technologies
• Prepare and present management reports
• Negotiate with internal/external customers, community and statutory/legal authorities
• Resolve conflict
• Manage blast material security

RESOURCE IMPLICATIONS

The resources available will be specific to this competency, the individual employer and the particular worksite as required to comply to the other elements of this unit.

Access to Metalliferous mine site using blasting operations.

INTERDEPENDENCE OF UNITS

Interrelationships of units - this unit may need to be applied in conjunction with other relevant units.

COMPETENCY STATEMENT

Competency in this unit needs to be assessed over a period of time to ensure consistency of performance in a range of environments, using a range of assessment instruments.

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</table>
MNMF5FX07A Plan and monitor water management

<table>
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<tr>
<th>ELEMENTS</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1</td>
<td>Plan and Prepare Water Management</td>
</tr>
<tr>
<td></td>
<td>7.1.2 Reuse and recycle opportunities are identified.</td>
</tr>
<tr>
<td></td>
<td>7.1.3 Site specific water recycling processes are designated.</td>
</tr>
<tr>
<td></td>
<td>7.1.4 Water withdrawals including volume and source use in normal and dry weather are defined.</td>
</tr>
<tr>
<td></td>
<td>7.1.5 Determine the adequacy of pumping capacities to meet current and future production needs.</td>
</tr>
<tr>
<td></td>
<td>7.1.6 Volume and quality of discharge is identified.</td>
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<tr>
<td></td>
<td>7.1.7 Clean and contaminated flows are segregated.</td>
</tr>
<tr>
<td></td>
<td>7.1.8 Treatment program for contaminated flows is selected.</td>
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<tr>
<td></td>
<td>7.1.9 Waste water volume usage and quality are estimated and how and where to store for treatment then discharge is identified.</td>
</tr>
<tr>
<td></td>
<td>7.1.10 Protection of groundwater sources is planned.</td>
</tr>
<tr>
<td></td>
<td>7.1.11 Existing neighbour water users and respective discharges are identified.</td>
</tr>
<tr>
<td></td>
<td>7.1.12 Surface water resources including hydrological data of rivers, streams, lakes and wetlands and present surface water quality data are identified.</td>
</tr>
<tr>
<td></td>
<td>7.1.13 Quality and potential of groundwater regime, local wells and surface water sources are identified.</td>
</tr>
</tbody>
</table>
7.1.14 Plan and monitor testing management system for discharge waters, in accordance with statutory/legal and company policies.

7.1.15 Discharge testing management system is planned.

7.1.14 Plan and monitor testing management system for discharge waters, in accordance with statutory/legal and company policies.

7.2 Develop and implement Drainage scheme for life of pit.

7.2.1 Contingency plans are developed and implemented for flood routing of waters in pit's operational area covering peak flows.

7.2.2 Pumping of waters from flooded pit, settlement ponds, holding dams or sump pits is organised.

7.2.3 Site plan from engineering detail and construct table drains, culverts, channels, pipeworks, trenches, manhole, gully pits as part of surface drainage and total reticulation network servicing the life of pit.

7.2.4 Basic Civil Engineering principles to water flow, pipelaying Techniques and earthwork activities associated with drainage and rural road geometry are applied.

7.2.5 Plan and interpret stage development of civil aspects to the work pits development is planned and interpreted.

7.2.6 Maintenance work for the drainage scheme of the mine site including pitworks, roadways, administration areas and boundary conditions is ongoing and supervised.

7.2.7 Instructions and information on drainage requirements are communicated.

7.2.8 Site drainage and waste water treatment processes is monitored.

7.2.9 Quality of site drainage effluent to meet environmental and company requirements is recorded.

7.2.10 Water treatment systems to meet specifications are designed.

7.3 Comply with environment, organisational/community and authority expectations/regulations.

7.3.1 Water management strategies are implemented as an integral part of the operation that adhere to regulatory, technical and environmental constraints and make for mining operations compatible with water conservation.
7.3.2 Working on hydrological effects and sensitive ecological/conservation sites is monitored.

7.3.3 Integrated measures taken to mitigate hydrological impact and to encourage best practice at specific sites are recorded and adopted.
RANGE OF VARIABLES

Management operates within:

- environments ranging from small/medium/large operations
- appropriate policies, guidelines and processes, legislations/codes and practices
- established quality and continuous improvement processes
- environmental standards
- ethical standards established by the organisation
- strategic plans developed by the organisation
- productivity and profitability objectives and targets
- international best practice and benchmarking principles and practices
- technical standards established by industry and/or enterprise
- resource parameters which may be defined or negotiated
- a diverse range of plant/equipment, products and services
- training and development
- business and performance plans
- enterprise/industrial agreements/awards
- human resource practices and policies
- learning organisation principles and practices.

Management is responsible for but is not limited to:

- evaluating equipment/plant and power requirements for mining operations
- preparing a commercial viable project budget
- evaluating, selecting, tendering and purchasing new equipment/plant
- sourcing and raising capital development funding
- planning and monitoring earth work operations
- monitoring project timeframes against budget
- commissioning geophysical surveys
- quantifying resource and proving deposit
- developing detailed site plans and working drawings
- establishing a rehabilitation plan in line with regulative requirements
- establishing and managing positive relations with others in the internal and external environment
- research which could include:
  - geological, climatic, hydrology/topography and environmental factors
  - cultural and biological environments
- monitoring water/equipment for leaching
- water run off monitoring for contaminants
- establishing bore fields
- knowledge of local rainfall
- measuring of water usage
- cost of water
- water wastage.

Protecting:

- water resource availability and quality
- quality of ground water resources
- surface waters and wetlands that are located downstream
• chemistry balance to maintain flora and fauna.

Management must comply with statutory/legal requirements this may include:
• environmental -noise/air/water
• quantities
• zonings
• boundaries
• processes
• royalties
• rehabilitation
• freehold
• council
• lease
• by-laws
• contamination
• wildlife corridors.

Statutory bodies may include, but are not limited to:
• Mineral Resources or appropriate body
• Occupational Health and Safety Authority
• Environmental/EPA
• Local Government
• Harbours and Marine
• Port Authority
• Mines Department
• Company policy and procedures
• Water Licensing Authority.

• Planning and development would typically include:
  – interpreting and communicating information
  – surveying
  – infrastructure/technology requirements and would typically incorporate the following specifications:
    * products
    * production rate
    * recyclable materials
    * stack emissions
    * hours per week of operation
    * waste and stockpiles
    * water/tailings management
    * transportation systems.
• All weather access/haul roads.

Permits required would include:
• Extractive
• Discharge
• Environment.
Site plans would include:
- layouts and water reticulation
- amenities
- culverts, drains, topography.

Management interacts/negotiates with but is not limited to:
- stakeholders
- regulative authorities
- tenderers
- operating managers
- project managers
- contractors
- employees
- community
- suppliers
- customers.

Resources may include, but are not limited to:
- people
- buildings/facilities
- finance
- equipment
- power/energy
- technology
- information
- time.

Water analysis would typically be:
- pit level
- water table
- turbidity
- heavy metals
- organics
- salinity
- acidity/alkalinity (pH)
- suspended solids
- hydrocarbons
- particular anions (e.g. CN).

Consultation would typically include:
- regulatory authorities
- tenderers
- project managers
- contractors
- employees
- customers
- community.
EVIDENCE GUIDE

CONTEXT

Competency must be assessed in the normal or simulated work environment within the bounds of safety and in accordance with work procedures.

Assessment shall include those aspects of the core competencies that are consistent with the work environment of this Unit.

Guidelines will be in line with statutory/legal requirements, enterprise specific policies and procedures and codes of practice.

CRITICAL ASPECTS AND EVIDENCE

It is essential that competence is fully observed in the critical aspects of:

- Water management systems
- Strategic planning
- Metalliferous mining operations
- Resource quantification
- Human resource management
- Statutory requirements
- Communicating ideas and information
- Management reporting
- Tender procedures
- Contract arrangements
- Financial planning
- Company products and services
- Customer relations
- Occupational Health and Safety
- Environmental management
- Continuous improvement processes.

UNDERPINNING KNOWLEDGE

A knowledge of:

- Metalliferous Mining Water Management Systems
- Metalliferous Mining Products and Services
- Metalliferous Mining Plant and Equipment
- Drainage systems
- Team Management
- Quality System
- Statutory Control
- Organisational Objectives
- Resource Monitoring
- Surveying
- Financial Management
UNDERPINNING SKILLS

The ability to:

- Monitor and Maintain Water Management Systems
- Manage people and processes
- Develop business/resource plans
- Prepare operating budgets
- Analyse and review water management systems
- Manage projects and tasks
- Co-ordinate resources - human, financial and physical
- Deliver and maintain services to required specifications
- Manage equipment and maintenance systems
- Evaluate new and used equipment using appropriate techniques
- Control operating costs
- Audit water management performance - energy, safety, environment, quality assurance, legislative compliance
- Gain statutory/legal approvals
- Prepare tender specifications
- Negotiate and finalise contracts
- Implement change
- Access and use appropriate technologies
- Prepare and present management reports
- Negotiate with internal/external customers, community and statutory/legal authorities
- Resolve conflict

RESOURCE IMPLICATIONS

The resources available will be specific to this competency, the individual employer and the particular worksite as required to comply to the other elements of this unit.

Access to a Metalliferous mine site that has a wet pit and/or wet processing plant.

INTERDEPENDENCE OF UNITS

Interrelationships of units - this unit may need to be applied in conjunction with other relevant units.

COMPETENCY STATEMENT
Competency in this unit needs to be assessed over a period of time to ensure consistency of performance in a range of environments, using a range of assessment instruments.

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MNMF5FX08A Plan and monitor recycled material operations

This Unit applies in all contexts to the planning and monitoring recycling of materials at Metalliferous mine sites where the quality system provides for recycling.

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<th>ELEMENT</th>
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</thead>
<tbody>
<tr>
<td>8.1</td>
<td>Plan Recyclable Material Processing</td>
</tr>
<tr>
<td>8.1.1</td>
<td>Market opportunities are identified and explored to assist the organisation to forecast trends and options.</td>
</tr>
<tr>
<td>8.1.2</td>
<td>Feasibility study is undertaken to confirm market research and determine viability of project.</td>
</tr>
<tr>
<td>8.1.3</td>
<td>Recyclable materials processing is planned using on-site mobile equipment and fixed depots.</td>
</tr>
<tr>
<td>8.1.4</td>
<td>Storing of raw feed and products is planned.</td>
</tr>
<tr>
<td>8.1.5</td>
<td>Products are tested to support ongoing quality assurance.</td>
</tr>
<tr>
<td>8.1.6</td>
<td>Blending of secondary aggregates with A-grade materials to produce road base replacements is investigated.</td>
</tr>
<tr>
<td>8.1.7</td>
<td>Compatible equipment for the recycling process, storage and transport of reclaimable materials is designed.</td>
</tr>
<tr>
<td>8.2</td>
<td>Monitor Operations</td>
</tr>
<tr>
<td>8.2.1</td>
<td>Growth potential of the recycling industry is monitored.</td>
</tr>
<tr>
<td>8.2.2</td>
<td>New techniques are monitored, appraised and introduced and new systems and products are adopted.</td>
</tr>
<tr>
<td>8.2.3</td>
<td>Production rates and associated environmental impact results are monitored.</td>
</tr>
</tbody>
</table>
| 8.2.4   | Stockpiling and removal of separated saleable materials have a high level of cleanliness from
ones that need disposal/tipping are organised.

8.2.5 Ongoing testing of product is undertaken to comply with quality assurance requirements.

8.2.6 Cost analysis reports are produced in line with organisation requirements.

8.2.7 Records and reports are prepared and circulated to appropriate personnel, in line with organisation requirements.

RANGE OF VARIABLES

Management operates within:
- environments ranging from small/medium/large operations
- appropriate policies, guidelines and processes
- established quality and continuous improvement processes
- environmental standards
- ethical standards established by the organisation
- strategic plans developed by the organisation
- productivity and profitability objectives and targets
- international best practice and benchmarking principles and practices
- technical standards established by industry and/or enterprise
- legislation, codes and practices
- resource parameters which may be defined or negotiated
- a diverse range of plant/equipment, products and services
- training and development
- business and performance plans
- enterprise/industrial agreements/awards
- human resource practices and policies
- learning organisation principles and practices.

Management is responsible for but is not limited to:
- evaluating equipment/plant and power requirements for Metalliferous mining operations
- preparing a commercial viable project budget
- evaluating, selecting, tendering and purchasing new equipment/plant
- sourcing and raising capital development funding
- planning and monitoring earth work operations
- monitoring project timeframes against budget
- commissioning geophysical surveys
- quantifying resource and proving deposit
- developing detailed site plans and working drawings
- establishing a rehabilitation plan in line with regulative requirements
- establishing and managing positive relations with others in the internal and external environment
- research which could include:
  - geological, climatic, hydrology/topography and environmental factors
  - cultural and biological environments
• improve customer relations
• promote company image
• influence operational performance
• plan production schedules
• records/reports
  – oral/written/computer based
• supervision of maintenance.

Management must comply with statutory/legal requirements. These may include:
• environmental -noise/air/water
• quantities
• zonings
• boundaries
• processes
• royalties
• rehabilitation
• freehold
• council
• lease
• by-laws
• contamination
• wildlife corridors.

Statutory bodies may include, but are not limited to:
• Mineral Resources or appropriate body
• Occupational Health and Safety Authority
• Environmental
• Federal/State/Local Government
• Water Supply
• Harbours and Marine
• Port Authority
• Road Authorities
• Company policy and procedures
• Planning and development would typically include:
  – interpreting and communicating information
  – surveying
  – infrastructure/technology requirements and would typically incorporate the following specifications:
    * products
    * production rate
    * recyclable materials
    * stack emissions
    * hours per week of operation
    * waste and stockpiles
    * water/tailings management
    * transportation systems
• All weather development drives and openings.
Management interacts/negotiates with but is not limited to:
- Stakeholders
- regulatory authorities
- tenderers
- operating managers
- project managers
- contractors
- employees
- community
- suppliers
- customers.

Resources may include, but are not limited to:
- people
- buildings/facilities
- finance
- equipment
- power/energy
- technology
- information
- time.

EVIDENCE GUIDE

CONTEXT

Competency must be assessed in the normal or simulated work environment within the bounds of safety and in accordance with work procedures.

Assessment shall include those aspects of the core competencies that are consistent with the work environment of this Unit.

Guidelines will be in line with statutory/legal requirements, enterprise specific policies and procedures and codes of practice.

CRITICAL ASPECTS AND EVIDENCE

It is essential that competence is fully observed in the critical aspects of:
- Recycled material operations
- Strategic planning
- Metalliferous mining operations
- Resource quantification
- Human resource management
- Statutory requirements
- Communicating ideas and information
- Management reporting
• Tender procedures
• Contract arrangements
• Financial planning
• Company products and services
• Customer relations
• Occupational Health and Safety
• Environmental management
• Continuous improvement processes.

UNDERPINNING KNOWLEDGE

A knowledge of:

• Metalliferous Mining Recycled Material Operations
• Metalliferous Mining Products and Services
• Metalliferous Mining Plant and Equipment
• Team Management
• Quality System
• Statutory Control
• Organisational Objectives
• Resource Monitoring
• Risk Management: Principles, Strategies and Applications
• Customer/Client Relations
• Organisational Change and Development
• Environmental Management
• Occupational Health and Safety
• Computer Applications
• Negotiation Techniques
• Statistics.

UNDERPINNING SKILLS

The ability to:

• Monitor and Maintain Recycled Material Operations
• Manage people and processes
• Prepare Capital Equipment Proposals
• Develop business/resource plans
• Prepare operating budgets
• Analyse and review operations/costs
• Manage projects and tasks
• Co-ordinate resources - human, financial and physical
• Deliver and maintain services to required specifications
• Manage equipment and maintenance systems
• Evaluate new and used equipment using appropriate techniques
• Control operating costs
• Audit recycled material operations performance - finance, safety, environment, quality assurance, legislative compliance, resource utilisation
• Gain statutory/legal approvals
• Prepare tender specifications
• Negotiate and finalise contracts
• Implement change
• Access and use appropriate technologies
• Prepare and present management reports
• Negotiate with internal/external customers, community and statutory/legal authorities
• Resolve conflict.

RESOURCE IMPLICATIONS

The resources available will be specific to this competency, the individual employer and the particular worksite as required to comply to the other elements of this unit.

Access to a Metalliferous mine site that processes recycled material.

INTERDEPENDENCE OF UNITS

Interrelationships of units - this unit may need to be applied in conjunction with other relevant units.

COMPETENCY STATEMENT

Competency in this unit needs to be assessed over a period of time to ensure consistency of performance in a range of environments, using a range of assessment instruments.

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</table>
### MNMF5FX09A Design stockpile formations and reclaiming systems

**STREAM**  F5 Mine Management Services  
**FIELD**  FX Mine Management  
**UNIT**  MNMF5FX09A Design stockpile formations and reclaiming systems

This Unit applies in all contexts in continually designing stockpile formations and the management of reclaiming systems.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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</table>
| 9.1 Identify stockpile requirements. | 9.1.1 Stockpiling requirements are identified.  
  9.1.2 Economics and efficiency of the stock piling system and configuration to be used is evaluated.  
  9.1.3 Statutory requirements for locating of plant and stockpile are identified and implemented. |
| 9.2 Design stockpile configuration | 9.2.1 Stockpile configuration is designed with appropriate drainage system.  
  9.2.2 Reclaim systems is designed to match stockpile configuration.  
  9.2.3 Load mechanisms are matched to stockpile requirements.  
  9.2.4 Dust control measures are designed and installed to ensure correct operations.  
  9.2.5 Safety requirements associated with the operation and machine movements are planned, organised and supervised. |
| 9.3 Monitor stockpile operations | 9.3.1 Operators are instructed on the outcomes required including Occupational Heath & Safety issues and safe work procedures.  
  9.3.2 Stockpiling operation is monitored including surveying, forming, order or dumping, ramp.  
  9.3.3 Material removal from stockpile is monitored in accordance to Quality Assurance specifications.  
  9.3.4 Stock quantities are assessed and reconciled. |
RANGE OF VARIABLES

Management operates within:
- an environment ranging from small/medium/large operations
- appropriate policies, guidelines and processes
- established quality and continuous improvement processes
- environmental standards
- ethical standards established by the organisation
- strategic plans developed by the organisation
- productivity and profitability objectives and targets
- international best practice and benchmarking principles and practices
- technical standards established by industry and/or enterprise
- legislation, codes and practices
- resource parameters which may be defined or negotiated
- a diverse range of plant/equipment, products and services
- training and development
- business and performance plans
- enterprise/industrial agreements/awards
- human resource practices and policies
- learning organisation principles and practices.

Management is responsible for but is not limited to:
- evaluating equipment/plant and power requirements for Metalliferous mining operations
- preparing a commercial viable project budget
- evaluating, selecting, tendering and purchasing new equipment/plant
- sourcing and raising capital development funding
- planning and monitoring earth work operations
- monitoring project timeframes against budget
- commissioning geophysical surveys
- quantifying resource and proving deposit
- developing detailed site plans and working drawings
- establishing a rehabilitation plan in line with regulative requirements
- establishing and managing positive relations with others in the internal and external environment
- research which could include:
  - geological, climatic, hydrology/topography and environmental factors
  - cultural and biological environments
- improve customer relations
- promote company image
- influence operational performance
- plan production schedules
- records/reports
  - oral/written/computer based
- supervision of maintenance.
- Planning and development would typically include:
  - interpreting and communicating information
  - surveying
– infrastructure/technology requirements and would typically incorporate the following specifications:
  * products
  * production rate
  * recyclable materials
  * stack emissions
  * hours per week of operation
  * waste and stockpiles
  * water/tailings management
  * transportation systems

  • All weather development drives and openings.

Management interacts/negotiates with but is not limited to:
  • Stakeholders
  • regulatory authorities
  • tenderers
  • operating managers
  • project managers
  • contractors
  • employees
  • community
  • suppliers
  • customers.

Resources may include, but are not limited to:
  • people
  • buildings/facilities
  • finance
  • equipment
  • power/energy
  • technology
  • information
  • time.

Stockpile configurations may include, but are not limited to:
  • sprinkler systems to keep stockpiles damp to control dust
  • sprinkler systems for leach gold extraction
  • method of storing
  • method of loading
  • end use size
  • site modification
  • access to and from stockpile
  • material, size, shape
  • amount to be stored
  • weather conditions
  • stockpile floor
  • segregation
  • safety of area
• reconciliation of stocks/transfer
• stockpile identification
• reporting.

Stockpiling requirements may include but are not limited to:
• heap leaching surge stocking
• storage bins
• storage of finished products (concentrate)
• loading bay storage.
EVIDENCE GUIDE

CONTEXT

Competency must be assessed in the normal or simulated work environment within the bounds of safety and in accordance with work procedures.

Assessment shall include those aspects of the core competencies that are consistent with the work environment of this Unit.

Guidelines will be in line with statutory/legal requirements, enterprise specific policies and procedures and codes of practice.

CRITICAL ASPECTS AND EVIDENCE

It is essential that competence is fully observed in the critical aspects of:

- Metalliferous mining operations
- Stockpile design
- Monitor stockpile operations
- Human resource management
- Statutory requirements
- Communicating ideas and information
- Management reporting
- Tender procedures
- Contract arrangements
- Company products and services
- Customer relations
- Occupational Health and Safety
- Environmental management
- Continuous improvement processes.

UNDERPINNING KNOWLEDGE

A knowledge of:

- Metalliferous Mine Operations
- Metalliferous Mine Products and Services
- Stockpile design
- Stockpile configuration
- Team Management
- Quality System
- Statutory Control
- Organisational Objectives
- Surveying
- Risk Management: Principles, Strategies and Applications
- Customer/Client Relations
- Environmental Management
- Occupational Health and Safety
- Computer Applications
UNDERPINNING SKILLS

The ability to:

- Design and implement stockpile configuration
- Monitor and Maintain Stockpile Operations
- Manage people and processes
- Prepare Capital Equipment Proposals
- Analyse and review stockpile operations and costs
- Manage projects and tasks
- Co-ordinate resources - human, financial and physical
- Deliver and maintain services to required specifications
- Manage surface mining traffic
- Manage equipment and maintenance systems
- Evaluate new and used equipment using appropriate techniques
- Control operating costs
- Gain statutory/legal approvals
- Prepare tender specifications
- Negotiate and finalise contracts
- Access and use appropriate technologies
- Prepare and present management reports
- Negotiate with internal/external customers, community and statutory/legal authorities
- Resolve conflict.

RESOURCES IMPLICATIONS

The resources available will be specific to this competency, the individual employer and the particular worksite as required to comply to the other elements of this unit.

Access to a Metalliferous mine site with stockpiling and reclaiming systems.

INTERDEPENDENCE OF UNITS

Interrelationships of units - this unit may need to be applied in conjunction with other relevant units

COMPETENCY STATEMENT

Competency in this unit needs to be assessed over a period of time to ensure consistency of performance in a range of environments, using a range of assessment instruments.

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<td>Chapter</td>
<td>Points</td>
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<td>-------------------------------------------</td>
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</tr>
<tr>
<td>5  Using Mathematical Ideas and Techniques</td>
<td>3</td>
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<tr>
<td>6  Solving Problems</td>
<td>3</td>
</tr>
<tr>
<td>7  Using Technology</td>
<td>3</td>
</tr>
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</table>
**MNMF5FX10A Design, implement and maintain process control systems**

**STREAM**  |  F5 Mine Management Services  
**FIELD**   |  FX Mine Management  

**UNIT**  |  MNMF5FX10A Design, implement and maintain process control systems  

**MNMF5FX10A**  
This Unit applies in all contexts to the designing, implementing and maintaining the use of process control systems.

<table>
<thead>
<tr>
<th>ELEMENT</th>
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</table>
| 10.1 Design Process Control Systems | 10.1.1 Equipment to meet the production needs of the extractive operation is analysed and selected.  
10.1.2 Mechanical and technological advances in the bulk extraction, transport, handling and processing of extractive materials are optimised.  
10.1.3 Safe practices, policies and training for entire extractive operation are initiated, encouraged and monitored.  
10.1.4 Field conditions are surveyed, modified and recorded.  
10.1.5 Parameters are designed, evaluated, measured and costed, and downstream effects are identified.  
10.1.6 Suppliers/manufacturers are consulted for developing solutions to particular problems, projects and needs.  
10.1.7 Computing systems are compared and solutions recommended based on cost, support, material, quality produced, flexibility, servicing, environmental impact, profitability.  
10.1.8 Monitoring and control systems are planned for effective management of the processing of materials and reliability of equipment.  
10.1.9 Accurate records for budgeting and future decision making and planning are maintained.  
10.2 Maintain quality of extractive materials. | 10.2.1 Accepted testing procedures used for assessing material quality in site laboratories are implemented and monitored.  
10.2.1 Electrical suppliers for power requirements, cabling, size of supply equipment, over-use penalties, tariffs, means of improving efficiency and back-up supplies are negotiated. |
10.2.2 Appropriate expertise to perform tests that achieve consistent results, in line with site specific quality systems that conform to independent testing authority standards maintained.

3 Appropriate work practices in line with statutory/legal requirements covering all potential environmental problems are applied.

10.2.4 Materials are blended to improve the product quality and to produce the best balance of properties for the customer's satisfaction.

5 Adjustments to production process to meet production quality parameters in accordance with site quality plan are recommended.

10.3 Provide advice to customers

10.3.1 Customers/clients are consulted and offered a range of materials and their properties available to suit identified needs of customer.

2 Material properties for various uses are identified.

10.4 Resource and environmental knowledge.

1 Data is collected and used on existing climate, air quality, water resources, flora and fauna and socio-economic items in pre-production, operational and post-production control phases.

10.5 Carry out fault diagnosis and repairs.

10.5.1 Routine monitoring and maintenance procedures for testing equipment in line with manufacturers specification.

10.5.2 Laboratory personnel are trained to maintain effectiveness of site quality system

RANGE OF VARIABLES

Management operates within:
- an environment ranging from small/medium/large operations
- appropriate policies, guidelines and processes
- established quality and continuous improvement processes
- environmental standards
- ethical standards established by the organisation
- strategic plans developed by the organisation
- productivity and profitability objectives and targets
- international best practice and benchmarking principles and practices
- technical standards established by industry and/or enterprise
- legislation, codes and practices
- resource parameters which may be defined or negotiated
- a diverse range of plant/equipment, products and services
- training and development
- business and performance plans
enterprise/industrial agreements/awards
human resource practices and policies
learning organisation principles and practices.

Management is responsible for but is not limited to:
• evaluating equipment/plant and power requirements for Metalliferous mining operations
• preparing a commercial viable project budget
• evaluating, selecting, tendering and purchasing new equipment/plant
• sourcing and raising capital development funding
• planning and monitoring earth work operations
• monitoring project timeframes against budget
• commissioning geophysical surveys
• quantifying resource and proving deposit
• developing detailed site plans and working drawings
• establishing a rehabilitation plan in line with regulative requirements
• establishing and managing positive relations with others in the internal and external environment
• research which could include:
  – geological, climatic, hydrology/topography and environmental factors
  – cultural and biological environments
• improve customer relations
• promote company image
• influence operational performance
• plan production schedules
• records/reports
  – oral/written/computer based
• supervision of maintenance.

Statutory authorities may include, but are not limited to:
• Mineral Resources or appropriate body
• Occupational Health and Safety Authority
• Environmental
• Federal/State/Local Government
• Harbours and Marine
• Port Authority
• Company policy and procedures
• Planning and development would typically include:
  – interpreting and communicating information
  – surveying
  – infrastructure/technology requirements and would typically incorporate the following specifications:
    * products
    * production rate
    * recyclable materials
    * stack emissions
    * hours per week of operation
    * waste and stockpiles
    * water/tailings management
* transportation systems
• All weather development drives and openings.

Management interacts/negotiates with but is not limited to:
• Stakeholders
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Resources may include, but are not limited to:
• people
• buildings/facilities
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• power/energy
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• information
• time.

EVIDENCE GUIDE

CONTEXT

Competency must be assessed in the normal or simulated work environment within the bounds of safety and in accordance with work procedures.

Assessment shall include those aspects of the core competencies that are consistent with the work environment of this Unit.

Guidelines will be in line with statutory/legal requirements, enterprise specific policies and procedures and codes of practice.

CRITICAL ASPECTS AND EVIDENCE

It is essential that competence is fully observed in the critical aspects of:
• Strategic planning
• Metalliferous mining operations
• Human resource management
• Metalliferous mining monitoring systems
• Statutory requirements
• Communicating ideas and information
• Management reporting
• Tender procedures
• Company products and services
• Customer relations
• Occupational Health and Safety
• Environmental management
• Continuous improvement processes

UNDERPINNING KNOWLEDGE

A knowledge of:

• Programmable Logic Controllers
• Metalliferous Mining Operations
• Metalliferous Mining Products and Services
• Metalliferous Mining Plant and Equipment
• Team Management
• Quality System
• Statutory Control
• Organisational Objectives
• Resource Monitoring
• Surveying
• Environmental Management
• Occupational Health and Safety
• Computer Applications
• Negotiation Techniques
• Statistics.

UNDERPINNING SKILLS

The ability to:

• Monitor and Maintain Metalliferous Mining Operations
• Manage people and processes
• Analyse and review production operations
• Manage projects and tasks
• Co-ordinate resources - human and physical
• Deliver and maintain services to required specifications
• Manage Metalliferous mine traffic
• Manage equipment and maintenance systems
• Evaluate new and used equipment using appropriate techniques
• Audit the surface mine's performance - finance, energy, safety, environment, quality assurance, legislative compliance and products
• Access and use appropriate technologies
• Prepare and present management reports
• Negotiate with internal/external customers, community and statutory/legal authorities
• Resolve conflict.
RESOURCE IMPLICATIONS

The resources available will be specific to this competency, the individual employer and the particular worksite as required to comply to the other elements of this unit.

Access to a Metalliferous mine site or processing plant using process control systems.

INTERDEPENDENCE OF UNITS

Interrelationships of units - this unit may need to be applied in conjunction with other relevant units.

COMPETENCY STATEMENT

Competency in this unit needs to be assessed over a period of time to ensure consistency of performance in a range of environments, using a range of assessment instruments.

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MNMF5FX11A Implement the ventilation management system

STREAM F5 Mine Management Services
FIELD FX Mine Management
UNIT MNMF5FX11A Implement the ventilation management system

MNMF5FX11A
This Unit applies in all contexts to the routine operational management required to implement a ventilation management system.

<table>
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<tbody>
<tr>
<td>11.1 Plan and Prepare for the Implementation of the Ventilation Management System</td>
<td>11.1.1 The legislative, statutory and site requirements related to ventilation management are identified and interpreted.</td>
</tr>
<tr>
<td></td>
<td>2 The ventilation management system documentation is accessed, interpreted and clarified.</td>
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<tr>
<td></td>
<td>11.1.3 Roles and responsibilities, as specified in the ventilation management system, are identified, clarified and communicated to all involved persons.</td>
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<tr>
<td></td>
<td>11.1.4 Resources required for the implementation of the ventilation management system are identified, forecast, obtained and allocated / scheduled.</td>
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<td></td>
<td>11.1.5 The ventilation management training program is implemented.</td>
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<tr>
<td></td>
<td>11.1.6 Suggestions and recommendations for changes to ventilation management implementation procedures are encouraged, received, reviewed and, where appropriate, implemented.</td>
</tr>
</tbody>
</table>
11.2 Implement the Ventilation Management System.

11.2.1 The impact of changes to the ventilation system on the mine atmosphere is identified and interpreted.

11.2.2 Procedures for the installation and operation of monitoring systems and equipment are implemented.

11.2.3 Ventilation control measures are incorporated into the ventilation system.

11.2.4 Procedures for monitoring, recording and reporting on mine ventilation are implemented according to statutory requirements and practices.

11.2.5 Procedures for the collection and analysis of ventilation data are implemented.

11.2.6 Monitoring system data is processed, recorded and reported in accordance with the requirements of the ventilation management system.

7 Measured data is interpreted and compared with statutory requirements and/or those stipulated by the ventilation management plan.

11.2.8 Water management procedures are implemented in accordance with the ventilation management system.

11.2.9 Alarms raised are responded to in accordance with the ventilation management system.

10 Ventilation emergency and evaluation plans are implemented in accordance with the ventilation management system.

11.3 Implement the Maintenance of and Changes to the Mine Ventilation System.

11.3.1 Inspections, repair and maintenance activities are implemented in accordance with the ventilation management system.

11.3.2 The system of recording, reporting and reviewing maintenance requirements and activities is implemented.

11.3.3 Changes to the mine ventilation systems are implemented in accordance with the ventilation management system procedures.

11.4 Audit the Effectiveness of the Ventilation Management System

11.4.1 Ventilation standards are audited for compliance with statutory and/or ventilation management system specifications.

2 Ventilation control measures are audited for compliance with statutory and/or ventilation management system requirements.

11.4.3 Monitoring systems operations are audited for compliance with to statutory and/or ventilation
management system standards.

11.4.4 Periodic review of alarm settings is implemented in accordance with the ventilation management plan.

11.4.5 Recording systems are audited for compliance with the ventilation management system.

11.4.6 Ventilation system maintenance program and procedures are audited for compliance with the ventilation management system procedures.

11.4.7 Ventilation emergency and evacuation plans are trialed and audited for compliance with the ventilation management system.

11.4.8 The ventilation management training program is audited for currency, relevance and compliance with the ventilation management system.
DEFINITIONS

For the purposes of this competency, the definitions below apply:

1 Ventilation system is one which covers all the mine workings and it includes all surface and underground fans and ventilation measures which control or impact on the mine ventilation.

2 Risk is the chance of something happening that will have an impact upon objectives. It is measured in terms of consequences and likelihood (AS/NZS 4360 : 1995).

3 Hazard is a source of potential harm or a situation with a potential to cause loss.

4 Mine ventilation management plans establish procedures for maintaining optimum mine ventilation including:
   - hazard identification and quantification
   - emergency and evacuation procedures
   - risk assessment
   - authority and responsibility
   - controls established to manage identified risks
   - reporting and communication
   - document control
   - audit and review.

5 Principles of mine design include mining direction, geological structures, ventilation, strata control, mining method, productivity and environmental considerations.

6 Action (alarm or trigger) is a generic term used to describe an event determined at the mine site at which action is initiated or a response made.

7 Audit is a validation process to ensure the system, procedures and processes, meet the established objectives and are implemented.

8 Standard operating procedures (SOP) are also known as safe working procedures, safe operating procedures and standard working procedures.

RANGE OF VARIABLES

- Mine atmosphere refers to all areas requiring ventilation in the developed underground mine.
- Geological conditions may include joint spacing, rock quality, faults, dykes, intrusions and strata deformities, as well as existing or induced stress or strain.
- Gas devices and options may include catalytic converters, infusion, scrubbers, automatic gas detectors, Drager sampling tubes, gas monitoring systems and stench gas alarm systems.
- Mine gas may include seam gases or gases from other introduced sources and may include, but are not limited to, methane, carbon dioxide, carbon monoxide, oxides of nitrogen,
hydrogen, sulphur dioxide, hydrogen sulphide, aldehydes, hydrocarbons and combinations including particulates.

- Other air contaminants may include respirable, irrespirable and combustible dust, fumes and particulates.
- Types of fires may include solid, liquid, gas or metals.
- Ignition sources may include electrical, static discharge, friction, contraband, spontaneous combustion, naked flame, chemical or explosives.
- Hazards from fires and explosions may include noxious and flammable gases, heat, contaminants, altered ventilation pressures / flows, direct physical impacts and weakening of the underground opening, complete disruption to the ventilation system.
- Disruptions / ventilation pressure changes may include those resulting from planned disruptions, changes in barometric pressure, fall of ground, fan changes / failure, ventilation control device changes / failure, holing into previous workings, re-circulation, ventilation circuit changes, natural ventilation pressure changes, explosions, changes in ambient temperature / humidity, fires, equipment moves and flooding of development drives and openings.
- Factors which may impact on temperature / humidity may include climatic conditions, ventilation quantities, location of workplaces, mine layout and design, location of mine entries, depth, rock pressure, adjacent geology, number and types of machinery and exhaust gas composition under varying temperatures and pressures.
- Recirculation causes may include or be related to the underground auxiliary / booster fans, scrubber systems, leaking ducts, failure or poor design of mining and ventilation systems, vent tubing not keeping pace with development activities, ventilation velocity pressures, natural ventilation pressures, gas densities, layering and wind blast.
- Effect of recirculation may include build up of contaminant concentration (gas, fumes, dust, heat) and a decrease in oxygen.
- Criteria for safe mine ventilation may include statutory and regulatory requirements, mine ventilation management plan, measures to reduce and/or control seam gas, introduced gas, fumes and dust, temperature / humidity and maximum / minimum velocity specifications and for ventilation efficiency.
- Mine design impacts on ventilation may be related to surface access, mining method / rate, barrier pillars and segregation of development drives and openings, system of mining, bleeder or back returns, number of headings, bleeders and geological features.
- Mining systems may include rock casing, open stopping, out fill, overhead, underhand, glory hole, multiple or single entry, bord and pillar (total or partial extraction).
- Factors which impact on the selection of ventilation control systems may include the life of the installation, ground conditions (stress / heave), operating duty (pressure / quantity),
mining method, design, explosion rating, statutory requirements, water and seam gas (make / composition).

- Methods of ventilation may include exhaust / force, antitropal, homotropal, flank returns, ascensional / descensional, bleeder, Z/U/Y systems and other combinations.

- Analytical and interpretative tools may include, fan laws, airway resistance, network analysis, computer simulation, gas laws, psychrometry and ventilation laws.

- Fan types are axial flow, venturi and centrifugal.

- Fan design considerations include types, mine layout, user requirements and fan laws, characteristics, duty control (speed / variable pitch), configuration (parallel / series), explosion / protection doors, dampers, auxiliary drive, restart procedures and maintenance requirements.

- Ventilation control devices may include doors, regulators, seals, stoppings, air crossings, bulk heads, goaf seals and pressure chambers, air locks and fans.

- Ventilation management training applies to mine workers, trades people, permanent employees, contractors, mine officials and other special requirements.

- Monitoring devices may include barograph, tube bundle, real time telemetry, portable (hand held) monitoring, bag samples and gas chromatography.

- Water may impact on the mine ventilation management plan through liberation of dissolved gases, capture of soluble gases and fumes, seam moisture infusion or drainage, dust liberation and suppression, large ingresses disrupting ventilation networks, ventilation requirements for pumping stations, humidity and hydrostatic pressure.

- Alarm systems and action plans may include those for gas concentration / make, combustion indicators, condition monitoring for fans (vibration / temperature / current / failures), ventilation devices and monitoring hardware.

- Surveys may include pressure / quantity / temperature survey and gas / dust survey.

- Standards and procedures required to support the ventilation management plan may include those for construction, action response, permit to work, condition monitoring, auditing, maintenance, document control, atmosphere monitoring, ventilation system control, communication systems, survey procedures, sealing procedures, changes, training and systems recording / reporting.

- Defects to ventilation control devices may include inferior design, deterioration of materials, inadequate quality of construction, physical damage and water damage.

- Maintenance of the ventilation system may include inspection, servicing and repair.

EVIDENCE GUIDE
CONTEXT

Competency must be assessed in the normal or simulated work environment within the bounds of safety and in accordance with work procedures.

Assessment shall include those aspects of the core competencies that are consistent with the work environment of this unit.

Guidelines will be in line with statutory/legal requirements, enterprise specific policies and procedures and codes of practice.

CRITICAL ASPECTS AND EVIDENCE

It is essential that competence is fully observed in the critical aspects of:

- applying personal and operational safety procedures
- interpreting and communicating information on implementing mine ventilation system
- identifying and responding to ventilation risks and hazards
- interpreting the contents of a mine ventilation management system
- implementing and communicating ventilation system procedures
- implementing mine ventilation monitoring, recording and reporting systems
- implementing the ventilation system maintenance program
- interpreting changes to mine ventilation systems
- implementing changes to mine ventilation system
- reviewing ventilation systems performance
- audit the ventilation systems performance
- implementing and auditing ventilation training programs
- responding to ventilation system failure and other allied emergency situations

UNDERPINNING KNOWLEDGE

A knowledge of:

- legislative and statutory requirements for ventilation including air quality, maximum values, control and distribution, flammable gas and dust limits, ventilation fans, gas monitoring, respirable dust limits and inspections and recording/reporting.
- the methods of mine ventilation and their applications/limitations including exhaust/force, antitropal, homotropal, flank returns, ascensional/descensional, bleeder, z/u/y systems and other combinations.
- the methods of panel ventilation and their applications/limitations including homotropal and antitropal auxiliary fans, coursed ventilation (narrow side/wide side), machine mounted scrubber systems, compressed air venturis and bleeders.
- the impact of mining techniques and mine and panel design on ventilation.
- mine roadways and shafts and their impact on mine ventilation.
- the impacts on the ventilation system of gas drainage, spontaneous combustion, outburst and windblast.
- mine gases; the types and their characteristics, sources, physiological effects and methods of detection.
- dust, fumes and other particulate matter; the types, sources, physical and physiological effect, and control/mitigation methods.
• mine fires; the types, sources of ignition, possible effects on the ventilation circuit and prevention / control / mitigation methods.
• mine fans; fan types, applications and limitations
• mine explosions; the types, ignition sources, possible effects on the ventilation circuits and prevention / control / mitigation methods.
• pressure changes; causes, the impacts on the ventilation system, and responses (to include the causes and effects of natural ventilation and recirculation).
• heat / humidity; the sources and factors which may impact on mine ventilation and personnel.
• ventilation control devices; the types, purposes, design criteria and specifications, distribution / placement criteria and limitations.
• de-gassing; methods of control - including brattice, auxiliary fans, compressed air venturis, sails, hurdles and bleeders.
• fixed ventilation monitoring systems types, uses and limitations.
• portable monitoring equipment, types, characteristics, uses and limitations.
• functions, capabilities, advantages, limitations and use of computer modelling tools and simulation techniques.
• computer-based systems for mine environment analysis.
• ventilation management plan development requirements and processes.
• ventilation surveys; the types, frequency and method for conducting including pressure / quantity / temperature and gas
• dust surveys for irrespirable quantity
• processes and techniques for determining alarms and trigger points / levels.
• audit and review processes and techniques.
• emergency and disaster plan response / measures.
• the general use and application of ventilation theory including:
  – Atkinson's equation
  – methods of determining frictional resistance
  – frictional resistance values for mine airways and ducts
  – psychrometry and heat
  – gas laws including Charles and Boyle
  – natural ventilation pressures
  – static/velocity/total pressures and shock loss
  – control device leakage
  – duct leakage
  – determination of mine resistance curves
  – combining system resistance and fan curves
  – regulator and equivalent orifice calculation
  – determination of fan operating / duty points.
  – Kirchoff's laws.

UNDERPINNING SKILLS

The ability to:

• access, interpret and apply technical information
• access and analyse archival and historical ventilation information related to the mine
• measure air quantity
• perform routine operational mathematical calculations (quantity, pressure, prediction)
• interpret and apply design criteria for ventilation systems and devices
• interpret computer spreadsheets and ventilation modelling / simulations
• collect, collate and interpret ventilation data
• conduct enquiries / investigations and prepare reports
• communicate effectively in the workplace
• access, interpret and apply data from monitoring systems and equipment
• operate hand held monitoring equipment
• implement the ventilation management training program
• apply risk management processes and techniques.

RESOURCE IMPLICATIONS

The resources available will be specific to this competency, the individual employer and the particular worksite as required to comply to the other elements of this unit.

Access to a Metalliferous mine site and relevant information relating to the implementation of a ventilation management system.

INTERDEPENDENCE OF UNITS

Interrelationships of units - this unit may need to be applied in conjunction with other relevant units.

COMPETENCY STATEMENT

Competency in this unit needs to be assessed over a period of time to ensure consistency of performance in a range of environments, using a range of assessment instruments.

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MNMF5FX12A Design systems for stable mining

This Unit applies in all contexts to the implementation and review of the operational development and maintenance required to sustain stable mining structures.

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<thead>
<tr>
<th>ELEMENT</th>
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<td>Plan and Prepare for Design Systems</td>
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<tr>
<td>12.2</td>
<td>Implement the Design System</td>
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12.2.4 The design system training requirement is implemented.

12.2.5 A maintenance program is implemented in accordance with the design system.

12.2.6 A monitoring system is implemented in accordance with the design system.

7 Reporting and recording systems are implemented in accordance with the design system.

12.2.8 Implementation procedures are monitored to ensure compliance with the approved plan.

12.2.9 Emergency and evacuation plan and procedures are implemented.

12.3 Audit and Review the Effectiveness of the Design System

1 Stable structure controls are audited for compliance with statutory and design system specifications.

12.3.2 Stable structure standards are audited for compliance with statutory and site requirements.

12.3.3 Monitoring systems are audited for compliance with statutory and design plan standards.

12.3.4 Recording and reporting systems are audited for compliance with statutory and site requirements.

12.3.5 System maintenance program and procedures are audited for compliance with statutory and site requirements.

12.3.6 The design training program is audited for currency, relevance and compliance with the design plan.

12.3.7 Emergency and evacuation plan and procedures are audited for compliance with site requirements.

DEFINITIONS

1. Audit is the validation process to ensure the system, procedures and processes meet the established objectives and are implemented.
2. Mine design is the process of engineering analysis applied to the systems and sequences involved in mining.

3. Risk is the chance of something happening that will have an impact upon objectives. It is measured in terms of consequences and likelihood (AS/NZ 4360: 1995).

4. Hazard is a source of potential harm or a situation with a potential to cause loss.

5. Standard operating procedures (SOP) are also known as safe working procedures, safe operating procedures and standard working procedures.

**RANGE OF VARIABLES**

- Resources may include but are not limited to skilled personnel, rock mechanics underground mine supports and equipment, power water/gas drainage systems and budgetary requirements.

- Mining systems and methods may include, but are not limited to, bord and pillar, rock casing, open stopping, overhead, underhand, outfill, glory hole, place changing, auger mining, pillar extraction and extraction, partial extraction, punch mining, systems of entry.

- Stress includes, but is not limited to, horizontal and vertical tectonic induced stress and mining induced stress.

- Geological and hydrogeological information includes that related to, but not limited to: subsidence, roof and floor technical data, gas content, over and underlying strata, waterbearing strata, permeability of rock formation and strata, physical properties, caving characteristics, faults, intrusions and deformities.

- Mine site historical information may include, but not limited to, existence of previous workings within the orebody, sedimentology aspects of the minesite relating to subsidence, Radon gas content, roof and floor technical data, over and underlying and adjacent rock formations, water bearing strata, permeability of formations, hydrology, physical property testing results, caving characteristics.

- Mine design may include in whole or in part footwall and hanging wall competency requirements relating to mine plant, mining induced stress, ventilation, tunnels, sequencing, drives, stone drivage, shaft sinking, pillar extraction, partial extraction, punch mining, modelling, ore grades, geology, fault management, fault drivage, roof and floor technical data, over and underlying strata, footwall and longwall subsidence and legislative and statutory requirements.

- Mine gases may include seam gases or gases from other introduced sources and may include methane, carbon dioxide, carbon monoxide, oxides of nitrogen, hydrogen, sulphur dioxide, hydrogen sulphide, aldehydes, hydrocarbons and combinations including particulates.
• Mine seam characteristics may include, but are not limited to: rank, petrology, moisture, cleat, seam gas, friability, pyrites and depositional factors such as seam thickness, multiple and rider seams, seam dip and depth of cover.

• Stable structure controls include, but are not limited to, roadway size, pillar sizes, depth of cover and underlying/overlying strata, stress regimes, underground opening characteristics, water ingress, systems of mining, breaker line supports and direction of mining.

EVIDENCE GUIDE

CONTEXT

Competency must be assessed in the normal or simulated work environment within the bounds of safety and in accordance with work procedures.

Assessment shall include those aspects of the core competencies that are consistent with the work environment of this unit.

Guidelines will be in line with statutory/legal requirements, enterprise specific policies and procedures and codes of practice.

CRITICAL ASPECTS AND EVIDENCE

It is essential that competence is fully observed in the critical aspects of:

• applying personal and operational safety procedures
• interpreting and communicating information on stable mining structures
• evaluating mine site and failure mode historical information relating to the implementation of stable mining structures
• identifying and recording resource requirements
• analysing and defining hazards and risks
• identifying and interpreting geological features
• interpreting and implementing mining system types and methods
• identifying and implementing equipment requirements
• interpreting, implementing and assessing ground support systems
• implementing workplace training/competency requirements
• identifying and evaluating exploration techniques
• auditing and reviewing mining structure stability
• implementing strata management systems
• implementing the training component of the strata management system
• implementing emergency and evacuation procedures
• implementing statutory reporting requirements.

UNDERPINNING KNOWLEDGE

A knowledge of:
• legislative and statutory requirements for mining structures including mine plans, ventilation, gas monitoring, strata support and safety management plans
• the systems of mining including tunnels, drifts, stone drivage, shaft sinking, pillar extraction, partial extraction, punch mining and fault drivage
• stress including mining induced stress, vertical and horizontal stress tectonics
• sedimentology including subsidence, water bearing strata, permeability of seam and strata, hydrology, physical property testing, caving characteristics, windblast, gas content and over and underlying strata
• systems of work including bord and pillar, place changing, rock casing, open stopping, outfill, auger mining, pillar extraction, partial extraction and punch mining
• mining structure failure modes
• exploration techniques
• geology and mine gas characteristics
• mining engineering principles
• lithology
• ground support systems
• audit methodologies
• mine site historical information
• limitations and controls.

UNDERPINING SKILLS
The ability to:

• apply exploration techniques
• apply mining constraints
• access, interpret and apply technical information relating to mine management
• access and analyse archival and historical mine management information related to the mine and failure mode of mine structures
• interpret and apply design criteria for mine management
• communicate effectively in the workplace
• prepare operating procedures relating to mine management
• conduct and report on audits
• identify and evaluate geological and geotechnical information.

RESOURCE IMPLICATIONS

The resources available will be specific to this competency, the individual employer and the particular worksite as required to comply to the other elements of this unit.

Access to a Metalliferous mine using mine design systems.

INTERDEPENDENCE OF UNITS

Interrelationships of units - this unit may need to be applied in conjunction with other relevant units.

COMPETENCY STATEMENT
Competency in this unit needs to be assessed over a period of time to ensure consistency of performance in a range of environments, using a range of assessment instruments.

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**MNMF5FX13A Implement mine transport systems and production equipment**

**STREAM**  
F5 Mine Management Services

**FIELD**  
FX Mine Management

**UNIT**  
MNMF5FX13A Implement mine transport systems and production equipment

This Unit applies in all contexts to the routine operational management functions required to implement production and transport systems and equipment.

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<tr>
<th>ELEMENT</th>
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<tr>
<td><strong>13.1</strong> Plan and Prepare for the Implementation of Production and Transport Systems and Equipment</td>
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</tr>
<tr>
<td><strong>13.1.1</strong> The legislative, statutory and site requirements related to production and transport systems are identified and interpreted.</td>
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<td><strong>13.1.2</strong> The purpose of production and transport systems and equipment are identified in accordance with the system of mining.</td>
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<td><strong>13.1.3</strong> Site requirements for the implementation of production and/or transport systems and equipment are identified and recorded.</td>
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<td><strong>13.1.4</strong> The specifications for the required production and/or transport systems and equipment are accessed and interpreted.</td>
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<td><strong>13.1.5</strong> Roles and responsibilities are identified, clarified and communicated.</td>
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<tr>
<td><strong>13.1.6</strong> The program to satisfy identified production and transport training requirements is implemented.</td>
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<tr>
<td><strong>13.1.7</strong> Standard operating procedures are accessed and interpreted.</td>
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| **13.2** Implement Systems for Installation and Commissioning of Production and Transport Systems and Equipment | | |
| **13.2.1** Hazards associated with the installation and operation of production and transport equipment and systems are identified, and risks are evaluated and responded to in accordance with established procedures. | |
| **13.2.2** Emergency response and evacuation plans and procedures are implemented in accordance with site requirements. | |
13.2.3 New and existing work systems and processes are integrated to achieve optimum performance.

13.2.4 Standard operating procedures are implemented.

5 Mine production and transport installation and commissioning procedures are implemented.

13.2.6 Equipment and systems are commissioned in accordance with manufacturers' specifications and site procedures.

13.2.7 Equipment and systems are modified to satisfy required changes arising from the commissioning process.

13.3 Implement Systems for the Operation and Maintenance of Production and Transport Systems and Equipment

13.3.1 Program and procedures for operations are implemented in accordance with legislative, manufacturers' and site requirements.

13.3.2 Reporting and recording systems are implemented in accordance with statutory and site requirements.

13.3.3 Maintenance program and procedures are implemented in accordance with manufacturers' and site maintenance requirements.

13.3.4 Procedures for reviewing and modifying work processes are implemented and applied.

13.4 Implement Systems for Audit, Review of Production and Transport Systems and Equipment

13.4.1 Production and transport systems standards are audited for compliance with statutory and site requirements.

13.4.2 Production and transport maintenance standards are audited for currency and compliance with statutory and site requirements.

13.4.3 Systems and equipment are audited for compliance with statutory and site requirements.

13.4.4 Emergency response and evacuation plans and procedures are audited for compliance with site requirements.

13.4.5 Reporting and recording systems for production and transport equipment are audited for compliance with statutory and site requirements.

13.4.6 The training program is audited for currency, relevance and compliance with site requirements.
DEFINITIONS

For the purposes of this standard, the definition below applies:

- Audit is the process by which the validation of procedures, processes and systems is assured.
- Risk is the chance of something happening that will have an impact upon objectives. It is measured in terms of consequences and likelihood (AS/NZ 4360: 1995).
- Hazard is a source of potential harm or a situation with a potential to cause loss.
- Standard operating procedures (SOP) are also known as safe working procedures, safe operating procedures and standard working procedures.

RANGE OF VARIABLES

- Transport systems include capacities for personnel, equipment/materials and product and may be wheeled, railed, tracked, skidded or conveyor or product slurry pumped, shaft winding based, pneumatic lifting systems.
- Wheeled transport may include but not be limited to, rubber tyred man transport, multi purpose vehicles, load haul dump, forklifts, front end loader, skid steer loader and grader, bogger or rocker shovel.
- Rail transport may include locomotives (electric/diesel) and rail mounted personnel carriers and rolling stock, drift haulage systems.
- Track vehicles may be fixed or mobile.
- Shaft winding systems may include product, personnel and material and may comprise head gear, cages and skips, winding apparatus and communications, control system discharge and loading facilities, counter balances, Kope winders.
- Conveyor system may include conveyor belts, drive heads, tail ends transfer points, surge bins, inter seam bins and fabricated bins.
- Product slurry pumping may include batching stations, dewatering systems and water reticulation pumping stations.
- Production equipment may include tunnel boring machines, raise borers, boggers, rocker shovels, drill jumbos, face drill rigs, roof bolters (mobile and hand held), rib bolters, auger miners, manual and remote controlled loaders, shotfiring and hydraulic mining.
- Safety information and standards may be contained in legislation and regulations, relevant International/Australian standards, management plans, manager's rules, OH&S policy, codes of practice, industry guidelines, approved standards, manufacturers' instructions, standard operational procedures and job instructions (or equivalent).
• Maintenance may be divided into predictive, preventive and breakdown.

• Site documentation and training policy may include but not be limited to statutory and legislative requirements, management plans and procedures.

• Specifications may include, but not be limited to, performance requirements, costs, dimensions, capacity, OH&S requirements, training requirements and key selection criteria.

**EVIDENCE GUIDE**

**CONTEXT**

Competency must be assessed in the normal or simulated work environment within the bounds of safety and in accordance with work procedures.

Assessment shall include those aspects of the core competencies that are consistent with the work environment of this unit.

Guidelines will be in line with statutory/legal requirements, enterprise specific policies and procedures and codes of practice.

**CRITICAL ASPECTS AND EVIDENCE**

It is essential that competence is fully observed in the critical aspects of:

• applying personal and operational safety procedures
• interpreting and communicating information on production and transport systems operations
• conducting a risk assessment to identify production and transport systems and equipment hazards and risks
• contribute to evaluating and selecting production and transport systems and equipment systems
• implement the training program
• reviewing and auditing the effectiveness of the management plan
• implementing the statutory reporting system
• implementing emergency response procedures

**UNDERPINNING KNOWLEDGE**

A knowledge of:

• legislative and statutory requirements and instructions including transport rules, maintenance schemes, SOP's, training, statutory testing on diesel vehicles, battery charging, underground fuel depots, conveyor belts.
• mine operation procedures
• geological structures
• mine plans
• mine design relating to production and transport systems and equipment
• production and transport systems and equipment management requirements
• site environmental monitoring requirements
• risk management procedures
• production and transport systems and equipment statutory inspection requirements
• mine reporting procedures
• emergency response and evacuation planning processes and techniques
• maintenance surveys
• audit review processes and techniques
• production and transport systems and equipment; the types, uses, characteristics and
  limitations appropriate for safe operation at the mine site
• power sources including electrical, hydraulic, pneumatic, diesel
• safety design features of production and transport systems
• safe operating procedures relating to production and transport equipment
• stores system
• specification design criteria including noise, dust, lighting, ergonomics, remote control,
  physical clearance, confined space, visibility, seating vibration and machine equipment and
  personal protection training programs
• specification design criteria including noise, dust, lighting, ergonomics, remote control,
  physical clearance, confined space, visibility, seating vibration and machine equipment and
  personal protection
• training programs
• standard operating procedures relating to production and transport equipment
• safety design features for maintenance of production and transport equipment
• computer based systems
• fire fighting systems and precaution rules

UNDERPINNING SKILLS

The ability to:

• access, interpret and apply:
  - technical information
  - briefings and handover details
• assess the risks and consequences attached to production and transport systems and
  equipment
• implement procedures appropriate to mine operations for management of production and
  transport systems and equipment
• plan and coordinate work
• identify training needs related to production and transport systems
• interpret and apply manufacturers’ instructions
• conduct maintenance surveys.

RESOURCE IMPLICATIONS

The resources available will be specific to this competency, the individual employer and the
particular worksite as required to comply to the other elements of this unit.

Access to a Metalliferous mine site using mine transport systems and production equipment.
INTERDEPENDENCE OF UNITS

Interrelationships of units - this unit may need to be applied in conjunction with other relevant units.

COMPETENCY STATEMENT

Competency in this unit needs to be assessed over a period of time to ensure consistency of performance in a range of environments, using a range of assessment instruments.

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MNMF5FX14A Implement mine services systems

**ELEMENT** | **PERFORMANCE CRITERIA**
---|---
14.1 Plan and Prepare for Implementation of Mine Services Systems and Equipment | 14.1.1 The statutory and/or site requirements related to mine services systems are identified and interpreted.
 | 14.1.2 The purpose of mine services systems and equipment are identified in accordance with the system of mining.
 | 14.1.3 Site requirements for the implementation of mine services systems and equipment are identified and recorded.
 | 14.1.4 The specification for the required mine services equipment is accessed, identified and interpreted.
 | 14.1.5 Roles and responsibilities are identified, clarified and communicated.
 | 14.1.6 The program to satisfy identified mine services training requirements is implemented.
 | 14.1.7 Standard operating procedures are accessed and interpreted.
14.2 Implement Installation and Commissioning Procedures | 14.2.1 Hazards associated with the installation of mine services equipment and systems are identified and risks evaluated and responded to in accordance with established procedures.
 | 14.2.2 New and existing work systems and processes are integrated to achieve optimum performance.
 | 14.2.3 Standard operating procedures are implemented.
 | 14.2.4 Mine services equipment installation and commissioning procedures are implemented.
 | 14.2.5 Equipment is transported and delivered/installed at the work site in accordance with manufacturers'
instructions and site procedures.

6 Equipment and systems are commissioned in accordance with the manufacturers' specifications and site procedures.

7 Emergency response and evacuation plans and procedures are implemented in accordance with site requirements.

14.3 Implement Systems for the Operation and Maintenance of Mine Services Systems and Equipment.

14.3.1 Operational procedures for mine services systems and equipment are implemented according to site requirements.

14.3.2 Maintenance procedures for mine services systems and equipment are implemented according to manufacturers' and site requirements.

14.3.3 Procedures for reviewing and modifying work processes are implemented and applied.

14.4 Implement Systems for Audit, Review of Mine Services Systems and Equipment

14.4.1 Mine service systems standards are audited for compliance with statutory and site requirements.

14.4.2 Mine services and equipment maintenance standards are audited for currency and compliance with statutory and site requirements.

14.4.3 Mine services and equipment are audited for compliance with statutory and site requirements.

14.4.4 Reporting and recording systems are audited for compliance with statutory and site requirements.

14.4.5 Emergency response and evacuation plans and procedures are audited for compliance with site requirements.

14.4.6 The training program is audited for currency, relevance and compliance with site requirements.

DEFINITIONS

For the purposes of this standard, the definition below applies:

- Audit is the process by which the validation of procedures, processes and systems are assured.

- Risk is the chance of something happening that will have an impact upon objectives. It is measured in terms of consequences and likelihood (AS/NZ 4360: 1995).
• Hazard is a source of potential harm or a situation with a potential to cause loss.

• Standard operating procedures (SOP) are also known as safe working procedures, safe operating procedures and standard working procedures.

**RANGE OF VARIABLES**

• Mine services may include, but not be limited to, water, wastewater, compressed air, fire fighting, gas drainage, fuel, electrical and waste disposal, condition monitoring.

• A service system includes the functions of design, development, establishment, installation, operations, protection, maintenance, monitoring and recording and reporting process.

• Ancillary support systems may include, but not be limited to, mine plans, signage, stores system, development drives and openings, maintenance and drilling (raise boring and bore hole) and emergency response systems.

• Emergency response systems: refuge chambers, designated escape ways, alarm systems, guidance systems, emergency communication systems, self aided escape apparatus, mines rescue capability.

• Protection systems may include, but not be limited to, explosion barriers, electrical protection, compressed air protection, hydraulic protection, environment protection (stone dusting and dust suppression) mechanical protection and frictional ignition protection.

• Reticulation may include water management, pumping of solids, fluid reticulation and storage, material reticulation and storage (hydraulic, electric, water and compressed air). Reticulation system may be electrical or mechanical.

• Communication system may include, but not be limited to, oral, phones, radios and telemetry.

• Reporting and recording systems include site requirements and consist of phones, radios, computer systems, verbal and written.

• Safety services may include, but not be limited to, risk assessment process, fire fighting, first aid and mines rescue.

• Safety information and standards may be contained in legislation and regulations, relevant Australian standards, management plans, manager's rules, OH&S policy, codes of practice, manufacturers' instructions and standard working or job procedures (or equivalent), industry guidelines.

• Site documentation and training policy may include, but not be limited to, statutory and/or management systems and procedures.

• Specifications may include, but not be limited to, performance requirements, costs, dimensions, capacity, occupational health and safety requirements, training requirements, and key selection criteria.
EVIDENCE GUIDE

CONTEXT

Competency must be assessed in the normal or simulated work environment within the bounds of safety and in accordance with work procedures.

Assessment shall include those aspects of the core competencies that are consistent with the work environment of this unit.

Guidelines will be in line with statutory/legal requirements, enterprise specific policies and procedures and codes of practice.

CRITICAL ASPECTS AND EVIDENCE

It is essential that competence be fully observed in the critical aspects of:

- applying personal and operational safety procedures
- interpreting and communicating information on mine services systems operations
- conducting a risk assessment to identify mine services systems and equipment hazards and risks
- contributing to the evaluation and selection of mine services systems and equipment
- defining roles and responsibilities for the implementation of mine services systems
- implementing statutory reporting procedures
- developing / modifying work systems and procedures
- implementing the training system
- reviewing and auditing the effectiveness of the mine services operations
- implementing emergency response and evacuation plans and procedures

UNDERPINNING KNOWLEDGE

A knowledge of:

- legislative and/or site specific requirements for mine services including, but not limited to, mine plans, electrical rules, compressed air, electrical / mechanical equipment, inspection requirement, environmental management, explosion barriers, communication, emergency procedures, risk management, recording and reporting, mines rescue, OH&S, manufacturers' instructions, standard work procedures, training and fire fighting.
- emergency response and disaster planning processes and techniques
- audit review process and techniques
- mine operating procedures including those applying to transport systems, ore passes and hoisting systems, conveyor systems, systems of mining, ventilation system, gas management and mine water management, concentrate pumping systems
- mine design relating to mine services systems
- power sources including electrical, hydraulic, compressed air, diesel
- safety design features of mine services systems
- computer based systems
- training programs
- fire fighting systems and precaution rules
• safety design features for maintenance of mine services systems
• maintenance surveys
• stores systems.

UNDERPINNING SKILLS

The ability to:

• access, interpret and apply:
  - technical information
  - site/legislative requirements
  - records and reports
  - briefings and handover details
• assess the risks and consequences attached to mine services systems and equipment
• plan and coordinate work
• identify training needs related to mine services systems
• interpret and apply manufacturers’ instructions
• conduct maintenance surveys.

RESOURCE IMPLICATIONS

The resources available will be specific to this competency, the individual employer and the particular worksite as required to comply to the other elements of this unit.

Access to a Metalliferous mine site using mine services systems.

INTERDEPENDENCE OF UNITS

Interrelationships of units - this unit may need to be applied in conjunction with other relevant units.

COMPETENCY STATEMENT

Competency in this unit needs to be assessed over a period of time to ensure consistency of performance in a range of environments, using a range of assessment instruments.

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MNMF5FX15A Implement mine fixed plant and infrastructure systems

STREAM F5 Mine Management Services
FIELD FX Mine Management
UNIT MNMF5FX15A Implement mine fixed plant and infrastructure systems

This Unit applies in all contexts to the routine operational management functions required to implement and maintain mine fixed plant and infrastructure.

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<tbody>
<tr>
<td>15.1 Plan and Prepare for the Implementation of Mine Fixed Plant and Infrastructure Systems</td>
<td>15.1.1 The statutory and/or site requirements related to fixed plant and infrastructure are identified and interpreted.</td>
</tr>
<tr>
<td></td>
<td>15.1.2 The requirements of fixed plant, equipment and infrastructure are identified in accordance with mine design and system of mining.</td>
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<td>15.1.3 Site requirements for the implementation of fixed plant and infrastructure are identified and recorded.</td>
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<td>15.1.4 The specification for the required fixed plant and equipment is identified and interpreted.</td>
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<td>15.1.5 Roles and responsibilities are identified, clarified and communicated.</td>
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<td>15.1.6 The program to satisfy identified fixed plant and infrastructure training requirements is implemented.</td>
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<tr>
<td></td>
<td>15.1.7 Safe operating procedures are assessed and interpreted.</td>
</tr>
<tr>
<td>15.2 Implement Installation and Commissioning Procedures for Fixed Plant and Infrastructure</td>
<td>15.2.1 Hazards associated with the installation of fixed plant and infrastructure are identified and risks evaluated and responded to in accordance with established procedures.</td>
</tr>
<tr>
<td></td>
<td>15.2.2 New and existing fixed plant and infrastructure and processes are integrated to achieve optimum performance.</td>
</tr>
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<td></td>
<td>15.2.3 Safe operating procedures are implemented.</td>
</tr>
</tbody>
</table>
15.2.4 Fixed plant and infrastructure installation and commissioning procedures are implemented.

15.2.5 Fixed plant and infrastructure are transported and delivered/installed at the work site in accordance with manufacturers' instructions and site procedures.

15.2.6 Fixed plant and infrastructure systems are commissioned in accordance with manufacturers' instructions and site procedures.

15.2.7 Systems are modified to satisfy required changes arising from the commissioning process.

15.2.8 Emergency response and evacuation plans and procedures are implemented in accordance with site requirements.

15.3 Implement Systems for the Operation and Maintenance of Fixed Plant and Infrastructure

15.3.1 Operational procedures for fixed plant and infrastructure are implemented according to site requirements.

15.3.2 Maintenance procedures for fixed plant and infrastructure are implemented according to manufacturers' and site requirements.

15.3.3 Procedures for reviewing and modifying work processes are implemented and applied.

15.4 Implement Systems for Audit and Review of Fixed Plant and Infrastructure

15.4.1 Fixed plant and infrastructure standards are audited for compliance with statutory and site requirements.

15.4.2 Fixed plant and infrastructure maintenance standards are audited for currency and compliance with statutory and site requirements.

15.4.3 Fixed plant and infrastructure are audited for compliance with site standards.

15.4.4 Reporting and recording systems for fixed plant and equipment and infrastructure are audited for compliance with statutory and site requirements.

15.4.5 The training program is audited for currency, relevance and compliance with site requirements.

15.4.6 Emergency response and evacuation plans and procedures are audited for compliance with site
DEFINITIONS

For the purposes of this standard, the definition below applies:

- **Audit** is the process by which the validation of procedures, processes and systems are assured.

- **Risk** is the chance of something happening that will have an impact upon objectives. It is measured in terms of consequences and likelihood (AS/NZ 4360: 1995).

- **Hazard** is a source of potential harm or a situation with a potential to cause loss.

- **Standard operating procedures (SOP)** are also known as safe working procedures, safe operating procedures and standard working procedures.

RANGE OF VARIABLES

- **Infrastructure** may include, but is not limited to, fabrication and construction areas, servicing areas, refuelling points, workshops, dams, explosives magazines, training facility, bathrooms, HV switch rooms, lamp cabin, laboratory, storehouses, equipment storage areas, on site residential housing, site access (road, rail, air), battery rooms, water treatment plant, sewerage treatment plant, offices, emergency facilities (first aid, fire and rescue), mineral processing plant, stockpile and concentrate handling.

- **Fixed plant and equipment** may include but not be limited to, lathes, presses, gantry cranes, drills, grinders, service bays, testing rooms, process treatment plant, drive heads, pumps and stations, pipelines, ventilation fans, compressors, winders, haulage winches, battery chargers, air conditioning, generators, electrical switching / control / distribution equipment and gas plant.

- **Safety systems** may include, but not be limited to, legislation (legal requirements), location, site layout, purpose, environmental control (gas, noise, water, heat, dust), protection systems (guarding, fire protection and suppression, electricity, lightning arresters, ventilation in explosives magazines and earthing).

- **Reporting and recording systems** include site requirements and consist of phones, radios, computer systems, verbal and written.

- **Safety information and standards** may be contained in legislation and regulations, relevant Australian standards, management plans, manager's rules, OH&S policy, codes of practice, manufacturers' instructions, standard working or job procedures (or equivalents), codes of practice and industry guidelines.

- **Site documentation and training policy** may include, but not be limited to, statutory and legislative requirements, management plans and procedures.

- **Specifications** may include, but not be limited to, performance requirements, costs, dimensions, capacity, OH&S requirements, training requirements and key selection criteria.
CONTEXT

Competency must be assessed in the normal or simulated work environment within the bounds of safety and in accordance with work procedures.

Assessment shall include those aspects of the core competencies that are consistent with the work environment of this unit.

Guidelines will be in line with statutory/legal requirements, enterprise specific policies and procedures and codes of practice.

CRITICAL ASPECTS AND EVIDENCE

It is essential that competence is fully observed in the critical aspects of:
- applying personal and operational safety procedures
- interpreting and communicating information on fixed plant and equipment and infrastructure.
- conducting a risk assessment to identify fixed plant and equipment and infrastructure hazards and risks
- contributing to evaluating and selecting fixed plant, equipment and infrastructure systems
- defining roles and responsibilities for management of fixed plant and equipment and infrastructure
- implementing the training program
- reviewing and auditing the effectiveness of the fixed plant and infrastructure systems
- implementing statutory inspections and reporting
- developing / modifying work systems and procedures
- implementing emergency response and evacuation plans and procedures

UNDERPINNING KNOWLEDGE

A knowledge of:
- legislative, statutory, Australian standards and site specific requirements for plant and infrastructure including, but not limited to, mine plan, electrical rules, electrical / mechanical equipment, communications, emergency procedures, risk management, recording and reporting, mines rescue, OH&S, manufacturers' instructions, standard work procedures, training, fire fighting, handling and storage of dangerous goods, local government requirement and local power authority
- mine operation systems and procedures including transport systems, conveyor systems, systems of mining, ventilation system(s), gas management systems and mine water management systems
- stores systems
- development drives and openings maintenance
- protection systems
- reticulation systems
- specifications for fixed plant and infrastructure
• audit processes
• mine design principles and procedures relating to fixed plant and infrastructure systems
• power sources including electrical, hydraulic, pneumatic and diesel
• computer based systems
• training programs
• fire fighting systems and precaution rules
• safety design features for maintenance of fixed plant and infrastructure
• maintenance surveys

UNDERPINNING SKILLS

The ability to:

• access, interpret and apply:
  - technical information
  - site/legislative requirements
  - records and reports
  - briefings and handover details
• assess the risks and consequences attached to fixed plant and infrastructure systems and equipment
• develop procedures appropriate to mine operations for management of fixed plant and infrastructure systems and equipment
• plan and coordinate work
• identify training needs related to fixed plant and infrastructure systems
• interpret manufacturers' instructions
• conduct maintenance survey.

RESOURCE IMPLICATIONS

The resources available will be specific to this competency, the individual employer and the particular worksite as required to comply to the other elements of this unit.

Access to a Metalliferous mine site using mine fixed plant and infrastructure systems.

INTERDEPENDENCE OF UNITS

Interrelationships of units - this unit may need to be applied in conjunction with other relevant units.

COMPETENCY STATEMENT

Competency in this unit needs to be assessed over a period of time to ensure consistency of performance in a range of environments, using a range of assessment instruments.

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**MNMF5FX16A Implement emergency preparedness and response systems**

**STREAM**  
F5 Mine Management Services

**FIELD**  
FX Mine Management

**UNIT**  
MNMF5FX16A Implement emergency preparedness and response systems

This Unit applies in all contexts to the operational management required to implement the mine emergency preparedness and response systems/plans.

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<tr>
<td>16.1</td>
<td>Plan And Prepare For The Implementation Of The Emergency Preparedness And Response System/Plans.</td>
</tr>
<tr>
<td>16.1.1</td>
<td>The statutory and/or site requirements related to emergency preparedness and response management are identified and interpreted.</td>
</tr>
<tr>
<td>16.1.2</td>
<td>The emergency preparedness and response systems/plans are accessed, interpreted and clarified.</td>
</tr>
<tr>
<td>16.1.3</td>
<td>Roles and responsibilities, as specified in the emergency preparedness and response plans, are identified, clarified and communicated to all persons.</td>
</tr>
<tr>
<td>16.1.4</td>
<td>Resources required for the implementation of the emergency preparedness and response systems/plans are identified, forecast, obtained and allocated / scheduled.</td>
</tr>
<tr>
<td>16.1.5</td>
<td>The emergency preparedness and response training program is implemented.</td>
</tr>
<tr>
<td>16.1.6</td>
<td>Suggestions and recommendations for changes to emergency preparedness and response implementation procedures are encouraged, received, reviewed and, where appropriate, implemented.</td>
</tr>
</tbody>
</table>

16.2 Implement The Emergency Preparedness And Response Systems Plans

| 16.2.1  | Incident information is received and communicated in accordance with the emergency preparedness and response systems/plans |
| 16.2.2  | The nature and scope of the incident is assessed and communicated in accordance with the emergency preparedness and response systems/plans |
16.2.3 Relevant emergency system/plan is identified and implemented in accordance with the emergency preparedness and response system/plans.

16.2.4 Emergency response and evacuation systems/plans and procedures are implemented in accordance with the plan.

16.2.5 Procedures for monitoring, recording and reporting on emergency incidents are implemented according to the emergency preparedness and response systems/plan.

16.2.6 Procedures for the collection and analysis of emergency preparedness and response data are implemented.

16.2.7 Action plans to manage the situation/incident are developed and contributed to in accordance with the emergency system/plan.

16.2.8 Action plans are implemented in accordance with the emergency system/plan.

16.2.9 Required services, personnel, equipment and resources are deployed to meet action plan.

16.2.10 Effectiveness of action plan to achieve required outcomes is assessed and communicated in accordance with the emergency system/plan.

16.2.11 Incident information is communicated in accordance with the emergency plan.

16.3 Implement Post-Incident Management Procedures

16.3.1 Plans to manage post-incident actions are contributed to in accordance with statutory and/or site requirements.

16.3.2 Post-incident action plans are implemented in accordance with the emergency system/plan.

16.3.3 Investigations into the nature and cause of the situation/incident are contributed to and relevant reports are submitted in accordance with the emergency system/plan.

16.4 Audit the Emergency Preparedness And Response Plans

16.4.1 Emergency preparedness and response systems, plans and procedures are audited for compliance with statutory and/or emergency preparedness and response requirements.
16.4.2 Emergency preparedness and response communication and recording systems are audited for compliance with statutory and/or emergency preparedness and response requirements

16.4.3 Emergency preparedness and response training program is audited for currency, relevance and compliance with emergency preparedness and response systems/plans
**DEFINITIONS**

For the purposes of this standard, the definition below applies:

- Audit is the process by which the validation of procedures, processes and systems are assured.

- Risk is the chance of something happening that will have an impact upon objectives. It is measured in terms of consequences and likelihood (AS/NZ 4360: 1995).

- Hazard is a source of potential harm or a situation with a potential to cause loss.

- Standard operating procedures are also known as safe working procedures, safe operating procedures, job safety analysis and standard working procedures.

- Post-incident management is the control of activities arising from an incident and can include: legal advice, environmental aspects, CISD, interviewing, investigations, witness interview statements, restoration of normal operations, media releases, public relations, employee welfare and family support, security of evidence, liaison with statutory/legal bodies, statutory investigations, review of emergency procedures, documentation of ongoing operations, restoration of emergency preparedness.

**RANGE OF VARIABLES**

- Types of incident can be identified as, but not limited to: minor accident, major accident or fatality, underground explosion or fire, ignition, rockburst; spontaneous combustion, surface fire which disrupts operations, environmental incidents, bomb threat, terrorist attack.

- Incidents can be caused by, but are not limited to: explosion, fire, roof fall, strata, inrush, rockburst, irrespirable atmosphere, environmental incident, hazchem; explosives, vehicle accidents, wall collapse.

- Stakeholders can include, but are not limited to: shareholders, board of directors, employees, unions, families, contractors, insurance companies, suppliers, local community, manufacturers, Inspectorate, police, Mines Rescue Service, fire brigades, ambulance, medical staff, hospitals; critical incident stress debriefing organisations, local emergency management organisations, salvation army, clergy, state, federal and local government.

- Required services and resources can include, but are not limited to: internal mine services and resources, contractors, insurance companies, suppliers, local community, manufacturers, inspectorate, police, Mines Rescue Service, fire brigades, ambulance, medical staff, hospitals, critical incident stress debriefing organisations, local emergency management organisations, salvation army, clergy, state, federal and local government, media, coroner's representative, security services, solicitors, district check inspector, other mines, experts such as engineers, scientists, inertisation, down-hole camera, drill rigs, forensic.

- Communications can include radio, telephone, telemetry, verbal, written, computers, runners.
Equipment refers to that needed to control the incident and includes but is not restricted to rescue equipment, mining equipment, transport, specialised equipment from external sources, monitoring and analysis equipment.

Media can include radio, print media, television.

Operations facilities are those which are set up to manage an incident and can include, but are not restricted to operations centre, press room, mortuary, muster areas, meeting rooms, communications centres and networks.

Future operations can include, but are not restricted to sealing mine areas, restoration to full production, suspension of operations, full closure of mine.

**EVIDENCE GUIDE**

**CONTEXT**

Competency must be assessed in the normal or simulated work environment within the bounds of safety and in accordance with work procedures.

Assessment shall include those aspects of the core competencies that are consistent with the work environment of this unit.

Guidelines will be in line with statutory/legal requirements, enterprise specific policies and procedures and codes of practice.

**CRITICAL ASPECTS AND EVIDENCE**

It is essential that competence is fully observed in the critical aspects of:
- applying personal and operational safety procedures
- interpreting and communicating information on implementing emergency preparedness and response plans.
- identifying and responding to risks and hazards
- interpreting the contents of mine emergency preparedness and response plans.
- implementing and communicating emergency preparedness and response procedures
- responding to incidents
- interpreting changes to mine emergency preparedness and response systems
- implementing changes to mine emergency preparedness and response systems
- reviewing emergency preparedness and response plans performance
- auditing emergency preparedness and response systems performance
- implementing and auditing emergency preparedness and response training programs

**UNDERPINNING KNOWLEDGE**

A knowledge of:
- legislative and statutory requirements for emergency preparedness and response systems
- legislation applicable to mines.
• emergency response planning processes and techniques
• audit review process and techniques
• training and assessment principles.
• industry and legislative stakeholders.
• mine incidents and risks
• classification of incidents.
• structure of emergency procedures guidelines.
• legal requirements of incident management teams.
• hazard identification.
• self-escape philosophies, systems and equipment.
• risk management principles and techniques.
• structure of emergency organisations
• structure, roles, capabilities and limitations of external services and agencies relevant to emergency preparedness and response
• rescue team structure, procedures and equipment.
• standby team requirements
• intervention and control techniques for spontaneous combustion, fires, explosions, rockburst, extrication or inrushes
• the effects of heat and humidity.
• the effects of visibility.
• ventilation and its influence on incidents
• escape strategies and technology.
• environmental risks and controls.
• equipment requirements for different types of emergency.
• deployment of staff underground.
• call-out procedures.
• emotional effects of emergencies on rescuers and mine personnel.
• titles and roles of members of incident management team.
• the requirements and structure for fresh air base.
• legal implications of incidents.
• the role of stakeholders.
• numbers needed to run the mine at planned operational levels.
• equipment handling.
• economic considerations and decisions.
• insurance policies and considerations.
• mine closure procedures and the legislative implications.
• sealing procedures and the legislative implications.

UNDERPINNING SKILLS

The ability to:

• access, interpret and apply technical information relevant to emergency preparedness and response
• access and analyse emergency preparedness and response information related to the mine
• interpret and apply design criteria for emergency preparedness and response systems and plans
• collect, collate and interpret incident/emergency data
• carry out fault-tree analyses.
• conduct enquiries / investigations and prepare reports
• communicate effectively in the workplace
• access, interpret and apply data from monitoring systems and equipment
• operate hand held monitoring equipment
• implement the emergency preparedness and response training program
• apply risk management processes and techniques

RESOURCE IMPLICATIONS

The resources available will be specific to this competency, the individual employer and the particular worksite as required to comply to the other elements of this unit.

Access to a Metalliferous mine site using emergency preparedness and response systems.

INTERDEPENDENCE OF UNITS

Interrelationships of units - this unit may need to be applied in conjunction with other relevant units.

COMPETENCY STATEMENT

Competency in this unit needs to be assessed over a period of time to ensure consistency of performance in a range of environments, using a range of assessment instruments.

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**MNMF5FX18A Apply, monitor, rectify and report statutory / legal compliance**

**STREAM** F5 Mine Management Services  
**FIELD** FX Mine Management  
**UNIT** MNMF5FX18A Apply, monitor, rectify and report statutory / legal compliance  

This Unit applies in all contexts to the application, monitoring, rectifying and reporting of the organisation's Statutory/Legal compliance in the relevant work areas.

<table>
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<th>ELEMENTS</th>
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| 18.1 Access and share legislation, codes and standards with site Personnel. | 18.1.1 Legislation, standards and the organisation's policies and practices relevant to the creation and maintenance of workplace statutory/legal compliance are made available to individuals/teams.  
18.1.2 Arrangements are made to provide information in a language, style and format which is understood by colleagues.  
18.1.3 The implication of non-conformance is clear to all within the workplace. |
| 18.2 Plan and implement requirements. | 18.2.1 Work practices are planned with colleagues to ensure compliance with workplace legislation and standards.  
18.2.2 Work practices are implemented in accordance with work requirements specified in legislation and standards for workplaces.  
18.2.3 Coaching and mentoring supports colleagues in managing their rights and responsibilities. |
| 18.3 Monitor, adjust and report performance. | 18.3.1 Actual and potential problems are identified, rectified and reported promptly and decisively to ensure workplace compliance.  
18.3.2 Activities are managed so that potential non-compliance are minimised.  
18.3.3 Recommendations on improvements to comply with legislation and associated standards are submitted to designated persons/groups. |
18.3.4 Individuals/teams are informed of the results of improvements in the workplace.

18.3.5 Systems, records and reporting procedures are maintained according to legislative requirements and enterprise policies.

18.4 Investigate and report non-conformance.

18.4.1 Non-conformance is investigated and dealt with according to legislative requirements and enterprise policies and procedures.

2 Coaching and mentoring supports colleagues to acquire and apply competencies to meet legislative requirements and the associated standards.

18.4.3 Training needs are identified and programs implemented.

18.4.4 Workplace practices are implemented to ensure that non-conformance is not repeated.

**RANGE OF VARIABLES**

This competency standard is applicable for those with frontline management responsibilities. This may be a Supervisor, Site Co-ordinator, Team Leader or a person holding a similar position. To be exhibited in the work area of responsibility but typically relates to Metalliferous operations.

*In accordance with all relevant statutory/legal requirements, particularly:*

- general duty of care
- requirements for the maintenance and confidentiality of records of non-compliance
- requirements for the maintenance of records of breaches
- provision of information and training
- regulations and codes of practice relating to hazards present in work area
- site/workgroups representatives and committees
- issue resolution.

**Statutory/legal compliance may include but is not limited to:**

- Trade Practices
- Weights and Measures
- Waterways
- Workers Compensation/Workcover
- Planning and Assessment
- Local Government
- Minerals and Extractive Industry Licensing
- Industrial Relations
- Dangerous Goods
- Navigation
- Mines Act
- Common Law.
Frontline Managers operate within:
- work schedules may include shift work and varying hours of duty
- environments ranging from simple to complex and diverse
- appropriate policies, guidelines and processes
- a level of autonomy which may range from limited to substantial
- business and performance plans
- ethical standards established by the organisation
- productivity and profitability objectives and targets
- best practice and benchmarking principles and practices
- legislation, codes and practices
- resource parameters which may be defined or negotiated
- training and development principles and practices
- human resource policies and practices including interviewing, counselling, dispute settling and discipline
- financial accountability including profit and loss statements
- enterprise/industrial agreements/awards.

Frontline Managers may assume varying roles including:
- leader
- coach
- facilitator
- mentor
- participant
- director
- trainer
- assessor.

Frontline Managers will typically make decisions to:
- influence operational performance
- plan production schedules
- maximise production and minimise operating costs/risks and non-conformances
- analyse and review market/production predictions and costs
- manage projects and tasks.

Resources may include, but are not limited to:
- acts
- legislation/regulations
- information.

Negotiations may be with a variety of internal or external sources and be:
- formal or informal
- short term or ongoing
- multi-lingual and cross-cultural
- enterprise agreements
- legislation regulation compliance and include relative authorities, project managers, employees, contractors, customers and the community.

Consultation would typically include:
• regulatory authorities
• tenderers
• project managers
• contractors
• employees
• community customers
• suppliers
• manager
• senior/specialist manager.

EVIDENCE GUIDE

CONTEXT

Competency must be assessed in the normal or simulated work environment within the bounds of safety and in accordance with work procedures.

Assessment shall include those aspects of the core competencies that are consistent with the work environment of this unit.

Guidelines will be in line with statutory/legal requirements, enterprise specific policies and procedures and codes of practice.

CRITICAL ASPECTS AND EVIDENCE

It is essential that competence is fully observed in the critical aspects of:

• Metalliferous Operations
• Statutory/Legal Compliance
• Work instructions development
• Appraisal and Auditing Procedures
• Acts.

UNDERPINNING KNOWLEDGE

A knowledge of:

• Statutory/legal Control
• Work Procedure/Instruction Writing
• Human Resource Management
• Occupational Health & Safety Auditing
• Company Policy.

UNDERPINNING SKILLS

The ability to:

• Develop and introduce practices to improve the work environment.
• Use effective consultative mechanisms to negotiate processes and procedures appropriate to statutory/legal requirements.
• Explain complex information to superiors/subordinates.
• Provide coaching and mentoring support.

RESOURCE IMPLICATIONS

The resources available will be specific to this competency, the individual employer and the particular worksite as required to comply to the other elements of this unit. Relevant statutory/legal standards and guidelines relating to Federal, State/Territory and Local Government Acts applicable to a Metalliferous site.

INTERDEPENDENCE OF UNITS

Interrelationships of units - this unit may need to be applied in conjunction with other relevant units.

COMPETENCY STATEMENT

Competency in this unit needs to be assessed over a period of time to ensure consistency of performance in a range of environments, using a range of assessment instruments.

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</tr>
<tr>
<td>6 Solving Problems</td>
<td>2</td>
</tr>
<tr>
<td>7 Using Technology</td>
<td>2</td>
</tr>
</tbody>
</table>
MNMF5FX19A Apply, monitor and report pit development systems

STREAM  F5 Mine Management Services
FIELD    FX Mine Management
UNIT     MNMF5FX19A Apply, monitor and report pit development systems

MNMF5FX19A
This Unit applies in all contexts to the application, monitoring and reporting of pit development systems.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>19.1</td>
<td>Plan resource use.</td>
</tr>
<tr>
<td>19.1.1</td>
<td>Action plans are prepared which make best use of the available raw feed resource, taking into account customer needs and organisation policies and practices.</td>
</tr>
<tr>
<td>19.1.2</td>
<td>Plans are prepared in consultation with team members.</td>
</tr>
<tr>
<td>19.1.3</td>
<td>Contingency plans are prepared in the event of a need to vary the initial plans.</td>
</tr>
<tr>
<td>19.2</td>
<td>Implement plan for use of resources.</td>
</tr>
<tr>
<td>19.2.1</td>
<td>Labour, materials, services and equipment are acquired on time from suppliers in line with accepted organisational practices and procedures.</td>
</tr>
<tr>
<td>19.2.2</td>
<td>Supervisors are involved in selection processes and induction of new team members.</td>
</tr>
<tr>
<td>19.2.3</td>
<td>Products and services are created and modified to customer satisfaction.</td>
</tr>
<tr>
<td>19.3</td>
<td>Implement, monitor and report pit development operations.</td>
</tr>
<tr>
<td>19.3.1</td>
<td>Supervise operations within limits of approved pit development.</td>
</tr>
<tr>
<td>19.3.2</td>
<td>Supervise stripping and stocking to sequential plan.</td>
</tr>
<tr>
<td>19.3.3</td>
<td>Supervise dewatering to plan.</td>
</tr>
<tr>
<td>19.3.4</td>
<td>Supervise extraction of raw feed to plan.</td>
</tr>
<tr>
<td>19.3.5</td>
<td>Supervise rehabilitation to plan.</td>
</tr>
<tr>
<td>19.3.6</td>
<td>Supervise tailings deposition/treatment to plan.</td>
</tr>
<tr>
<td>19.3.7</td>
<td>Supervise maintenance of development drives and openings to design standard, and safety and environmental standards.</td>
</tr>
<tr>
<td>19.3.8</td>
<td>Supervise establishment of banks to stability criteria and supervise measurement to plan.</td>
</tr>
<tr>
<td>19.3.9</td>
<td>Supervise blasting activities to plan, and safety</td>
</tr>
<tr>
<td>19.4</td>
<td>Review resource capability and utilisation.</td>
</tr>
<tr>
<td>19.4.1</td>
<td>Recommendations for improving resource capability and usage are investigated, and either acted on or reported.</td>
</tr>
</tbody>
</table>
19.4.2 Coaching is provided to assist colleagues who have difficulty in using resources within quality, cost and time standards.

19.5 Record and report resource usage.

19.5.1 Systems, procedures and records associated with resource usage are maintained in accordance with the organisation's needs.

RANGE OF VARIABLES

Supervisors, Site Co-ordinators and Team Leaders planning and use of resources typically involves reference to:

- customer needs
- strategic goals of the organisation
- productivity and profitability plans
- quality and continuous improvement processes and standards
- workplace industrial agreements
- established systems and procedures
- competencies of the workforce
- international best practice and benchmarking relevant to the industry
- legislation, codes and practices
- environmental standards
- ethical practices
- resource parameters whether defined or negotiated
- technical standards established by industry and/or enterprise
- business and performance plans.

Customers may be internal or external and drawn from:

- existing
- new sources.

Resources may include, but are not limited to:

- people
- equipment
- power/energy
- buildings/facilities
- technology
- information
- time
- water.

Records/reports may be:

- oral
- written
- computer based.

EVIDENCE GUIDE
CONTEXT

Competency must be assessed in the normal or simulated work environment within the bounds of safety and in accordance with work procedures.

Assessment shall include those aspects of the core competencies that are consistent with the work environment of this Unit.

Guidelines will be in line with statutory/legal requirements, enterprise specific policies and procedures and codes of practice.

CRITICAL ASPECTS AND EVIDENCE

It is essential that competence is fully observed in the critical aspects of:

- Metalliferous operations
- Resource quantification
- Human resource management
- Statutory/legal requirements
- Communicating ideas and information
- Management reporting
- Tender procedures
- Contract arrangements
- Financial planning
- Company Products and Services
- Customer Relations
- Environmental Management
- Management Styles and systems
- Continuous Improvement Process

UNDERPINNING KNOWLEDGE

A knowledge of:

- Metalliferous Operations
- Metalliferous Products and Services
- Metalliferous Plant and Equipment
- Team Management
- Quality System Principles
- Statutory/legal Control
- Organisational Objectives
- Resource Quantification
- Surveying
- Financial Models
- Fundamentals of Contract Law
- Industrial Awards/Enterprise Agreements
- Business Planning
- Risk Management: Principles, Strategies and Applications
- Customer/Client Relations
- Organisational Change and Development
- Environmental Management
- Occupational Health and Safety
- Computer Applications
- Negotiation Techniques
- Statistics.

UNDERPINNING SKILLS

The ability to:

- interpret and analyse the business plans of the team/organisation
- identify resources required to meet customer needs
- identify resource requirements to achieve team/group plans
- managing resources to budget (or better)
- manage resources within the organisation's accountability requirements
- create products and services which are safe for customers to use
- encourage best practice use of resources
- involve colleagues in planning and using resources effectively and efficiently
- uses the appropriate technology to plan and manage resources
- monitor and introduces best practice to improve resource utilisation
- implement strategies to minimise resource inefficiencies and wastage
- provide learning support to colleagues who have difficulty in using resources to agreed standards
- record/report information accurately and on time
- optimise production from available resources
- assist in selecting and inducting new team members.

RESOURCE IMPLICATIONS

The resources available will be specific to this competency, the individual employer and the particular worksite as required to comply to the other elements of this unit.

Access to a Metalliferous pit and relevant information relating to implementation, monitoring and preparing Metalliferous pit development.

INTERDEPENDENCE OF UNITS

Interrelationships of units - this unit may need to be applied in conjunction with other relevant units.

COMPETENCY STATEMENT

Competency in this unit needs to be assessed over a period of time to ensure consistency of performance in a range of environments, using a range of assessment instruments.

<table>
<thead>
<tr>
<th>KEY COMPETENCY</th>
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<td>1 Collecting, Analysing and Organising Information</td>
<td>2</td>
</tr>
<tr>
<td>2 Communicating Ideas and Information</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Planning and Organising Activities</td>
</tr>
<tr>
<td>---</td>
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</tr>
<tr>
<td>4</td>
<td>Working with Others in Teams</td>
</tr>
<tr>
<td>5</td>
<td>Using Mathematical Ideas and Techniques</td>
</tr>
<tr>
<td>6</td>
<td>Solving Problems</td>
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<tr>
<td>7</td>
<td>Using Technology</td>
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# MNMF5FX20A Lead and monitor surface mining operations and report outcomes

<table>
<thead>
<tr>
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<tr>
<td>FIELD</td>
<td>FX Mine Management</td>
</tr>
<tr>
<td>UNIT</td>
<td>MNMF5FX20A Lead and monitor surface mining operations and report outcomes</td>
</tr>
</tbody>
</table>

This Unit applies in all contexts to the day to day control and co-ordination of onsite surface mining operations.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>20.1</td>
<td>Lead elements of overall site operations according to operator competency requirements.</td>
</tr>
<tr>
<td></td>
<td>20.1.1 Labour, materials, services and equipment are acquired on time from suppliers in line with accepted organisational practices and procedures, to maintain smooth operations.</td>
</tr>
<tr>
<td></td>
<td>20.1.2 Supervisors are involved in selection processes and induction of new team members.</td>
</tr>
<tr>
<td></td>
<td>20.1.3 Products and services are created and modified to customer satisfaction.</td>
</tr>
<tr>
<td></td>
<td>20.1.4 Supervisors are involved in outsourcing and inducting contractors in surface mining operations.</td>
</tr>
<tr>
<td>20.2</td>
<td>Lead and monitor onsite training, performance and development of operators and contractors.</td>
</tr>
<tr>
<td></td>
<td>20.2.1 Site training plans are accessed, interpreted and actioned.</td>
</tr>
<tr>
<td></td>
<td>20.2.2 Work is organised so that it makes effective use of human resources in achieving the surface mining operations goals and business plans.</td>
</tr>
<tr>
<td></td>
<td>20.2.3 Guidance and training support is provided to individuals and team to develop the appropriate work competencies to achieve individual, team and organisation plans.</td>
</tr>
<tr>
<td></td>
<td>20.2.4 Feedback is provided to individuals and teams on their work performance.</td>
</tr>
<tr>
<td></td>
<td>20.2.5 Climate which fosters performance and improvement is developed.</td>
</tr>
<tr>
<td>20.3</td>
<td>Lead and participate in site risk management, OH&amp;S, environment and other appropriate systems.</td>
</tr>
<tr>
<td></td>
<td>20.3.1 Work is performed in a safe and fair environment.</td>
</tr>
<tr>
<td></td>
<td>20.3.2 Potential and actual problems are identified and analysed, options evaluated and plans implemented.</td>
</tr>
<tr>
<td></td>
<td>20.3.3 Hazards are managed so that their treatment effect is minimised.</td>
</tr>
<tr>
<td></td>
<td>20.3.4 Recommendations to achieve compliance with, and improve standard procedures and practices are submitted to designated persons/groups for</td>
</tr>
<tr>
<td>Section</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>20.3.5</td>
<td>Systems, records and reporting procedures are maintained as required by statutory/legal, organisational and manufacturers’ requirements.</td>
</tr>
<tr>
<td>20.3.6</td>
<td>Team members are informed of the results of improvements in the work environment.</td>
</tr>
<tr>
<td>20.3.7</td>
<td>Non-conformances are investigated and dealt with according to agreed procedures and processes.</td>
</tr>
<tr>
<td>20.3.8</td>
<td>Training, coaching and mentoring support is provided to ensure co-workers develop competencies to prevent recurrence of non-conformances.</td>
</tr>
<tr>
<td>20.4.1</td>
<td>Action plans are prepared which make best use of the available resources, taking into account customer needs and organisation policies and practices.</td>
</tr>
<tr>
<td>20.4.2</td>
<td>Plans are prepared in consultation with team members.</td>
</tr>
<tr>
<td>20.4.3</td>
<td>Contingency options are prepared and evaluated in the event of a need to vary the initial working plans.</td>
</tr>
<tr>
<td>20.4.4</td>
<td>Personnel are allocated roles and responsibilities, based on operational requirements and competencies of individuals/teams and/or contractors. Daily operations are monitored and adjustment to plans, in line with operational/customer requirements are made.</td>
</tr>
<tr>
<td>20.4.5</td>
<td>Pit processes/practices are reviewed to facilitate optimal results and best practice.</td>
</tr>
<tr>
<td>6</td>
<td>Systems, procedures and records associated with pit operations are maintained in accordance with the organisation's needs.</td>
</tr>
<tr>
<td>20.5.1</td>
<td>Action plans are prepared which make best use of the available resources, taking into account customer needs and organisation policies and practices.</td>
</tr>
<tr>
<td>20.5.2</td>
<td>Plans are prepared in consultation with team members.</td>
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<tr>
<td>20.5.3</td>
<td>Contingency options are prepared in the event of a need to vary the initial working plans.</td>
</tr>
</tbody>
</table>
| 20.5.4 | Personnel are allocated roles and responsibilities, based on operational requirements and
competencies of individuals/teams and/or contractors. Daily operations are monitored and adjustment to plans, in line with operational/customer requirements are made.

20.5.5 Systems, procedures and records associated with processing plant operations are maintained in accordance with the organisation's needs.

6 Processing plant operations/practices are audited and reviewed to achieve optimal results and best practice.

20.6 Participate in, monitor, review and report on performance of quality system

20.6.1 Action plan is established to ensure completion of process/project to customer satisfaction, within quality, time, environment and cost parameters.

20.6.2 Action plans are in accord with organisation goals, strategies and operational plans.

20.6.3 Key performance indicators for function/section are developed and measured, using collaborative processes with individuals and teams.

20.6.4 Products and services are delivered to customer satisfaction within safe, legal, quality, product, time, cost and resource parameters and environmental constraints.

20.6.5 Contractors, team and individual performances consistently meet quality, environment, safety, resource and delivery standards.

20.6.6 Team members are informed of savings and productivity improvements resulting from quality systems implementation and maintenance.

20.6.7 Performance variations are addressed in a fair, constructive and timely manner.

8 Review outcomes are used to inform future action.

20.7 Participate in, monitor, review and report on management performance system

20.7.1 Performance is monitored against agreed plans and action is taken to continually improve results.

20.7.2 Systems and technology are used to assist the monitoring and reviewing processes.

20.7.3 Product and service delivery is adjusted promptly and decisively to satisfy customer and organisation requirements.

20.7.4 Customer feedback is used as important input in maintaining the quality of products and services.

20.7.5 Resources are used effectively and efficiently to maximise the results and outcomes.

20.7.6 Difficulties and obstacles to the achievement of plans are identified and treatment plans implemented.
<table>
<thead>
<tr>
<th>Section</th>
<th>Task Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>20.7.7</td>
<td>Responsibility is taken to make decisions to rectify deficiencies.</td>
</tr>
<tr>
<td>20.7.8</td>
<td>Training, coaching and mentoring support is provided to assist and develop team members in achieving the required level of competence.</td>
</tr>
<tr>
<td>9</td>
<td>Individual and team results and contributions are promoted and recognised.</td>
</tr>
<tr>
<td>20.8</td>
<td>Participate in, monitor, review, and report on continuous improvement system</td>
</tr>
<tr>
<td>20.8.1</td>
<td>Practices, processes and outcomes are monitored as part of the continuous improvement process.</td>
</tr>
<tr>
<td>20.8.2</td>
<td>Performance outcomes are regularly reviewed in consultation with others to identify performance variations.</td>
</tr>
<tr>
<td>20.8.3</td>
<td>Decisions and actions are considered to assess the effectiveness and efficiency of processes and outcomes.</td>
</tr>
<tr>
<td>20.8.4</td>
<td>Results are documented, evaluated and communicated within the organisation's reporting and continuous improvement processes.</td>
</tr>
<tr>
<td>20.8.5</td>
<td>Reports are prepared and presented to individuals and groups in a format and style appropriate to the audience within organisational guidelines.</td>
</tr>
<tr>
<td>20.8.6</td>
<td>Customer service is strengthened through the use of continuous improvement techniques and processes.</td>
</tr>
<tr>
<td>20.8.7</td>
<td>The contribution of individuals and teams in achieving the planned results is recognised.</td>
</tr>
<tr>
<td>8</td>
<td>Recommendations for improving the management of future processes are made to individuals and groups who have appropriate responsibilities.</td>
</tr>
<tr>
<td>20.9</td>
<td>Initiate team formation, monitor and report team performance</td>
</tr>
<tr>
<td>20.9.1</td>
<td>The need for teams is identified and clearly defined purpose, roles, responsibilities and accountabilities trails are established.</td>
</tr>
<tr>
<td>20.9.2</td>
<td>Team performance plans, including performance measures indicators are established in line with the mine's business plan, policies and procedures.</td>
</tr>
<tr>
<td>20.9.3</td>
<td>Systems and mechanisms are established to monitor and review team performance.</td>
</tr>
<tr>
<td>20.9.4</td>
<td>Team members are selected and trained and mentored for participation in team.</td>
</tr>
<tr>
<td>20.10</td>
<td>Monitor and report budget performance</td>
</tr>
<tr>
<td>20.10.1</td>
<td>The relationship between budget and actual performance is monitored.</td>
</tr>
<tr>
<td>20.10.2</td>
<td>Variations in budget performance are identified and action is taken to rectify out-of-specification results.</td>
</tr>
<tr>
<td>3</td>
<td>Recommendations on improving operating process</td>
</tr>
</tbody>
</table>

Monitor and report operational plant, equipment and systems maintenance performance according to organisation /statutory /legal bodies' requirements, policies and procedures and manufacturer's warranty.

20.11.1 Problems with plant and equipment are investigated, and promptly rectified and/or reported to designated person.

20.11.2 Alternative methods of using plant and equipment are analysed and implemented to off-set unsatisfactory performance.

20.11.3 Waste management methods are used effectively in recycling, waste reduction and waste disposal within organisation and legislative requirements.

20.11.4 Recommendations and strategies for improving maintenance systems and techniques are investigated, developed and either acted and/or reported on.

20.11.5 Training and coaching is provided to assist colleagues who have difficulty in maintaining resources within quality, cost and time standards to comply with organisation or site performance outcomes.

RANGE OF VARIABLES

Supervisors, Site Co-ordinators and Team Leaders planning and use of resources typically involves reference to:

- customer needs
- strategic goals of the organisation
- productivity and profitability plans
- quality and continuous improvement processes and standards
- workplace industrial agreements
- established systems and procedures
- competencies of the workforce
- international best practice and benchmarking relevant to the industry
- legislation, codes and practices
- environmental standards
- ethical practices
- resource parameters whether defined or negotiated
- technical standards established by industry and/or enterprise
- business and performance plans.

Customers may be internal or external and drawn from:

- existing
- new sources.

Resources may include, but are not limited to:

- people
- equipment
- power/energy
- buildings/facilities
- technology
- information
- time.

*Records/reports may be:*  
- oral  
- written  
- computer based.

Supervisors, Site Co-ordinators and Team Leaders will typically engage with all staff involved in surface mining operations.

Quarry plant and equipment may include, but is not limited to:

**MOBILE PLANT**  
- Front End Loader  
- Excavator  
- Dozer  
- Grader  
- Dumptruck  
- Scraper  
- Dragline  
- Bobcat  
- Drill jumbo  
- Bogger

- Roller  
- Watercart  
- Service/Maintenance Vehicle  
- Drill  
- Compressor  
- Generator  
- Crane

- Truck/Hiab  
- Backhoe  
- Face Shovel  
- Barge  
- Dredge  
- Cherry Picker  
- Tractor  
- Bucket wheel excavator  
- Surface Miner

**FIXED PLANT**

**CRUSHERS:**  
- Jaw  
- Gyratory  
- Vert Shaft Impactor  
- Cone
• Impactor/Hammermill
• Rolls
• Ball
• Autogenous
• Attrition
• Rod

SCREENS:
• Dewatering
• Trommel
• Harpwire
• Vibratory
• Inclined/horizontal
• Morganson Sizer
• Grizzly - Static
• Grizzly - Live
• Divergator
• Banana (sieve bend)

CONVEYORS:
• Stackers
• Bucket
• Chevron
• Screw
• Belt
• Overland - Track Shiftable

FEEDERS:
• Vibrating
• Belt
• Track/Caterpillar
• Apron
• Weigh belt
• Reclaim systems
• Reciprocating Plate

SAND & FINES
• Thickeners
• Cyclones
• Classifiers
• C.I.P.
• Jigs and Tables
• Gravity Plant
• Flotation
• Spirals

PROCESSING:
• Screw
• Tubs
• Heavy Media
• Scrubber
• Log Washer
• Thickener
• Clarifier
• Filter Press

ANCILLARY EQUIPMENT
• Bins
• Compressor
• Hoppers
• Silos
• Pumps
• Valves
• Walkways
• Electric Motors
• Generators
• Welders
• Ladders
• Stairways
• Hydraulic Units
• Control Rooms
• Dust extractor
• Substation
• Transformer
• Dust Suppression
• Lighting
• Dust extraction

BUILDINGS
• Weighbridge
• Offices
• Workshop
• Amenities

• Explosives magazines
• Ammonium nitrate store
• Fuel storage
• Oil store
• Cyanide store

• Hazardous goods store
• Laboratory
• Ablutions
• Change room
• First aid

INFRA-STRUCTURE
• Roads
• Dams
• Settling Ponds
• Tanks
• Bund walls
• Tailings Dams
• Overburden Dump
• Ore stockpiles
• Fencing
• Fire fighting equipment

• Car park
• Communications
• Power Supply

EVIDENCE GUIDE
CONTEXT
Competency must be assessed in the normal or simulated work environment within the bounds of safety and in accordance with work procedures.
Assessment shall include those aspects of the core competencies that are consistent with the work environment of this Unit.
Guidelines will be in line with statutory/legal requirements, enterprise specific policies and procedures and codes of practice.

CRITICAL ASPECTS AND EVIDENCE
It is essential that competence is fully observed in the critical aspects of:

- Strategic planning
- Metalliferous operations
- Resource quantification
- Human resource management
- Statutory/legal requirements
- Communicating ideas and information
- Management reporting
- Tender procedures
- Contract arrangements
- Financial planning
- Company Products and Services
- Customer Relations
- Occupational Health and Safety
- Environmental Management
- Management Styles and systems
- Continuous Improvement Process.

UNDERPINNING KNOWLEDGE
A knowledge of:

- Metalliferous Operations
- Metalliferous Products and Services
- Metalliferous Plant and Equipment
- Team Management
- Quality System
- Statutory/legal Control
- Organisational Objectives
- Resource Quantification
- Surveying
- Financial Models
- Fundamentals of Contract Law
- Industrial Awards/Enterprise Agreements
- Business Planning
- Risk Management: Principles, Strategies and Applications
• Customer/Client Relations
• Organisational Change and Development
• Environmental Management
• Occupational Health and Safety
• Computer Applications
• Negotiation Techniques
• Statistics.

UNDERPINNING SKILLS

The ability to:

• interpret and analyse the business plans of the team/organisation
• identify resources required to meet customer needs
• identify resource requirements to achieve team/group plans
• manage resources to budget (or better)
• manage resources within the organisation's accountability requirements
• create products and services which are safe for customers to use
• encourage best practice use of resources
• involve colleagues in planning and using resources effectively and efficiently
• use the appropriate technology to plan and manage resources
• monitor and introduces best practice to improve resource utilisation
• implement strategies to minimise resource inefficiencies and wastage
• provide learning support to colleagues who have difficulty in using resources to agreed standards
• record/report information accurately and on time
• optimise production from available resources
• assist in selecting and inducting new team members.

RESOURCE IMPLICATIONS

The resources available will be specific to this competency, the individual employer and the particular worksite as required to comply to the other elements of this unit.

Access to a Metalliferous surface mine.

INTERDEPENDENCE OF UNITS

Interrelationships of units - this unit may need to be applied in conjunction with other relevant units.

COMPETENCY STATEMENT

Competency in this unit needs to be assessed over a period of time to ensure consistency of performance in a range of environments, using a range of assessment instruments.
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<td>7 Using Technology</td>
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**MNMF5FX21A Apply and monitor the ventilation management system**

**STREAM**  F5 Mine Management Services  
**FIELD**  FX Mine Management

| UNIT | MNMF5FX21A Apply and monitor the ventilation management system |

MNMF5FX21A  
This Unit applies in all contexts to the application and monitoring of controls and systems established in the ventilation management plan.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 21.1 Plan and Prepare for the Application of the Ventilation Management Plan | 21.1.1 The legislative, statutory and site requirements related to ventilation management are identified and interpreted.  
21.1.2 The ventilation management plan is accessed, interpreted and clarified.  
21.1.3 Roles and responsibilities, as specified in the ventilation management plan, are identified and clarified.  
21.1.4 Work Group and individual responsibilities and tasks are communicated and clarified in an effective and timely manner.  
21.1.5 Resources required for the application of the ventilation management plan are identified, obtained and allocated.  
21.1.6 Individual training needs are identified and satisfied through accessing the established ventilation management training program and systems. |
| 21.2 Apply the Ventilation Management Plan. | 21.2.1 The impact of changes to the ventilation system on the mine atmosphere is identified and interpreted.  
21.2.2 Installation and operation procedures for monitoring systems and equipment are applied.  
21.2.3 Ventilation control devices are installed, monitored and maintained in the ventilation system in accordance with the ventilation management plan.  
21.2.4 Procedures for monitoring, recording and reporting on mine ventilation are applied according to statutory requirements and those of the ventilation management plan.  
21.2.5 Mine control devices are adjusted in accordance |
with the ventilation management plan.

21.2.6 Collection and analysis of ventilation data is carried out in accordance with the ventilation management plan.

21.2.7 Monitoring system data is recorded and reported in accordance with the requirements of the ventilation management plan.

21.2.8 Water management procedures are applied in accordance with the ventilation management plan.

21.2.9 Alarms raised are responded to in accordance with the ventilation management plan.

21.2.10 Ventilation emergency and evacuation procedures are applied in accordance with the Ventilation Management Plan.

21.2.11 Systems audit and review requirements are contributed to in accordance with the ventilation management plan.

21.3 Apply Ventilation System Maintenance Procedures

1 Inspections, repair and maintenance activities are scheduled and carried out in accordance with the ventilation management plan.

21.3.2 Maintenance requirements and activities are recorded, reported and reviewed in accordance with the ventilation management plan.

**DEFINITIONS**

**For the purposes of this competency, the definitions below apply:**

1 Ventilation system is one which covers all the mine workings, including waste and sealed areas, and it includes all surface and underground fans and ventilation devices which control or impact on the mine ventilation.

2 Mine ventilation control device means a door, regulator, seal, stopping, air crossings, pressure chambers or other control device to control or direct ventilation flows in a mine.

3 Risk is the chance of something happening that will have an impact upon objectives. It is measured in terms of consequences and likelihood (AS/NZS 4360 : 1995).

4 Hazard is a source of potential harm or a situation with a potential to cause loss.

5 Mine ventilation management plans establish procedures for maintaining optimum mine ventilation including:
   - hazard identification and quantification
- emergency and evacuation procedures
- risk assessment
- authority and responsibility
- controls established to manage identified risks
- reporting and communication
- document control
- audit and review

6 Principles of mine design include reserve optimisation, mining direction, geological structures, ventilation, strata control, mining method, productivity, environmental considerations and seam access.

7 Action (alarm or trigger) is a generic term used to describe an event determined at the mine site at which action is initiated or a response made.

8 Audit is a validation process to ensure the system, procedures and processes, meet the established objectives and are implemented.

9 Standard operating procedures (SOP) are also known as safe working procedures, safe operating procedures and standard working procedures.

**RANGE OF VARIABLES**

- Mine atmosphere refers to all areas in the general mine ventilation and beyond into waste working in the mine.

- Geological conditions may include faults, dykes, intrusions and geology deformities, as well as existing or induced stress or strain.

- Gas characteristics may include inherent factors such as rank, rock pressure, petrology, moisture, cleat, exhaust gas, friability, pyrites or depositional factors such as seam thickness, multiple and rider seams, seam dip and depth of cover.

- Gas devices and options may include infusion, scrubbers, automatic gas detectors, tube bundle systems, degassing device on auxiliary fans and gas monitoring systems.

- Mine gas may include exhaust gas or gases from other introduced sources and may include, but are not limited to, methane, radon, carbon dioxide, carbon monoxide, oxides of nitrogen, hydrogen, sulphur dioxide, hydrogen sulphide, hydrocarbons and combinations.

- Other air contaminants may include respirable, irrespirable and combustible dust, fumes and particulates.

- Types of fires may include solid, liquid, gas or metals.

- Ignition sources may include electrical, static discharge, friction, contraband, naked flame, chemical or explosives.
- Hazards from fires and explosions may include noxious and flammable gases, heat, contaminants, altered ventilation pressures / flows, direct physical impacts and weakening of the strata, complete disruption to the ventilation system.

- Disruptions / ventilation pressure changes may include those resulting from planned disruptions, changes in barometric pressure, fall of ground, fan changes / failure, ventilation control device changes / failure, outburst, holing into previous workings, re-circulation, ventilation circuit changes, natural ventilation pressure changes, explosions, changes in ambient temperature / humidity, fires, equipment moves and flooding of development driveways and openings.

- Factors which may impact on temperature / humidity may include climatic conditions, ventilation quantities, location of workplaces, mine layout and design, location of mine entries, depth, adjacent strata type, number and types of machinery and exhaust gas composition under varying temperatures and pressures.

- Recirculation causes may include or be related to the underground auxiliary / booster fans, scrubber systems, leaking ducts, failure or poor design of mining and ventilation systems, ventilation velocity pressures, natural ventilation pressures and gas densities.

- Effect of recirculation may include build up of contaminant concentration (gas, fumes, dust, heat) and a decrease in oxygen.

- Criteria for safe mine ventilation may include statutory and regulatory requirements, mine ventilation management plan, measures to reduce and/or control seam gas, introduced gas, fumes and dust, temperature / humidity and maximum / minimum velocity specifications and for ventilation efficiency.

- Mine design impacts on ventilation may be related to surface access, mining method / rate, barrier pillars and segregation of roadways, system of mining, bleeder or back returns, number of headings, bleeders and geological features.

- Mining systems may include rock casing, open stoping, overhand, underhand, outfill, glory hole, multiple or single entry, bord and pillar (total or partial extraction).

- Factors which impact on the selection of ventilation control systems may include the life of the installation, ground conditions (stress / heave), operating duty (pressure / quantity), mining method, design, explosion rating, statutory requirements, water and exhaust gas.

- Methods of ventilation may include exhaust / force, antitropal, homotropal, flank returns, ascensional / descensional, bleeder, Z/U/Y systems and other combinations.

- Analytical and interpretative tools may include, fan laws, airway resistance, network analysis, computer simulation, gas laws, psychrometry and ventilation laws.

- Fan types are axial flow, venturi and centrifugal.
• Fan design considerations include types, mine layout, user requirements and fan laws, characteristics, duty control (speed / variable pitch), configuration (parallel / series), explosion / protection doors, dampers, auxiliary drive, restart procedures and maintenance requirements.

• Ventilation control devices may include doors, regulators, seals, stoppings, air crossings, bulk heads, goaf seals and pressure chambers, air locks and fans.

• Fan design considerations include types, mine layout, user requirements and fan laws, characteristics, duty control (speed / variable pitch), configuration (parallel / series), explosion / protection doors, dampers, auxiliary drive, restart procedures and maintenance requirements.

• Ventilation control devices may include doors, regulators, seals, stoppings, air crossings, bulk heads, goaf seals and pressure chambers, air locks and fans.

• Ventilation management training applies to mine workers, tradespeople, permanent employees, contractors, mine officials and other special requirements.

• Monitoring devices may include barograph, tube bundle, real time telemetry, portable (hand held) monitoring, bag samples and gas chromatography.

• Water may impact on the mine ventilation management plan through liberation of dissolved gases, capture of soluble gases and fumes, gas drainage efficiency, seam moisture infusion or drainage, dust liberation and suppression, large ingresses disrupting ventilation networks, ventilation requirements for pumping stations, influence on sponcom propensity, humidity and hydrostatic pressure.

• Alarm systems and action plans may include those for gas concentration / make, spontaneous combustion (physical and gaseous), combustion indicators, condition monitoring for fans (vibration / temperature / current / failures), ventilation devices and monitoring hardware.

• Surveys may include pressure / quantity / temperature survey and gas / dust survey.

• Standards and procedures required to support the ventilation management plan may include those for construction, action response, permit to work, condition monitoring, auditing, maintenance, document control, atmosphere monitoring, ventilation system control, communication systems, survey procedures, sealing procedures, changes, training and systems recording / reporting.

• Defects to ventilation control devices may include inferior design, deterioration of materials, inadequate quality of construction, physical damage and water damage.

• Maintenance of the ventilation system may include inspection, servicing and repair.

EVIDENCE GUIDE

CONTEXT
Competency must be assessed in the normal or simulated work environment within the bounds of safety and in accordance with work procedures.

Assessment shall include those aspects of the core competencies that are consistent with the work environment of this Unit.

Guidelines will be in line with statutory/legal requirements, enterprise specific policies and procedures and codes of practice.

CRITICAL ASPECTS AND EVIDENCE

It is essential that competence is fully observed in the critical aspects of:
- applying personal and operational safety procedures
- interpreting and communicating information on mine ventilation
- interpreting ventilation risks and hazards
- interpreting the contents of a mine ventilation management plan
- applying statutory and mine ventilation monitoring, recording and reporting systems
- applying the ventilation system maintenance program
- interpreting changes to mine ventilation systems
- ensuring control device construction and maintenance is carried out to specified standards
- identifying workplace training/competency requirements
- responding to ventilation system failure and other allied emergency situations

UNDERPINNING KNOWLEDGE

A knowledge of:
- legislative and statutory requirements for ventilation including air quality, maximum values, control and distribution, flammable gas limits, ventilation fans, gas monitoring, dust limits and inspections and recording/reporting.
- the methods of mine ventilation and their applications / limitations including exhaust / force, antitropical, homotropical, flank returns, ascensional / descensional, bleeder, ZUY systems and other combinations.
- the methods of panel ventilation and their applications / limitations including homotropical and antitropical (and in conjunction with these, the use of goaf bleed or back return), auxiliary fans, coursed ventilation (narrow side / wide side), machine mounted scrubber systems, compressed air venturis, bleeders, sails and hurdles.
- the impact of mining techniques on panel ventilation.
- the impact of differing geological features and conditions on ventilation including faults, dykes, intrusions and strata deformities
- the impact of coal characteristics and coal seam gradients on mine ventilation design.
- the effects on the ventilation system of spontaneous combustion, outburst, gas drainage and windblast.
- mine gases; the types and their characteristics, sources, physiological effects and methods of detection.
- dust and other particulate matter; the types, sources, physical and physiological effect, and control/mitigation methods.
- mine fires; the types, sources of ignition, possible effects on the ventilation circuit and prevention / control / mitigation methods.
• mine explosions; the types, ignition sources, possible effects on the ventilation circuits and prevention / control / mitigation methods.
• pressure changes; causes, the impacts on the ventilation system, and responses (to include the causes and effects of natural ventilation and recirculation).
• heat / humidity; the sources and factors which may impact on mine ventilation and personnel.
• mine fans; fan types, applications and limitations.
• ventilation control devices; the types, purposes, specifications, distribution / placement criteria and limitations.
• fixed ventilation monitoring systems types, uses and limitations
• portable monitoring equipment, types, uses and limitations.
• computer-based systems for mine environment analysis.
• ventilation management plan development requirements and processes.
• ventilation surveys; the types, frequency and method for conducting including pressure / quantity / temperature and gas
• dust surveys for irrespirable quantity
• types, characteristics, purposes and responses to alarms and trigger points / levels.
• audit and review processes and techniques.
• emergency and disaster plan responses.
• the general use and application of ventilation theory including:
  – gas laws including Charles and Boyle
  – natural ventilation pressures
  – air quantity measurement
  – control device leakage
  – duct leakage
  – Kirchoff’s laws.

**UNDERPINNING SKILLS**

**The ability to:**

• access, interpret and apply technical information
• interpret and apply a limited range of mathematical and scientific theorems / laws related to ventilation
• perform basic mathematical calculations
• collect, collate and interpret ventilation data
• interpret and apply ventilation device construction / installation specifications
• conduct enquiries / investigations and prepare reports
• communicate effectively in the workplace
• access, interpret and apply data from monitoring systems and equipment
• operate hand held monitoring equipment
• apply risk management processes and techniques
• initiate ventilation training.

**RESOURCE IMPLICATIONS**
The resources available will be specific to this competency, the individual employer and the particular worksite as required to comply to the other elements of this unit.

Access to a Metalliferous mine and relevant information relating to applying and monitoring ventilation management systems.

**INTERDEPENDENCE OF UNITS**

Interrelationships of units - this unit may need to be applied in conjunction with other relevant units.

**COMPETENCY STATEMENT**

Competency in this unit needs to be assessed over a period of time to ensure consistency of performance in a range of environments, using a range of assessment instruments.

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<td>7 Using Technology</td>
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</table>
MNMF5FX22A Apply and monitor systems for stable mining

STREAM F5 Mine Management Services
FIELD FX Mine Management
UNIT MNMF5FX22A Apply and monitor systems for stable mining

MNMF5FX22A
This Unit applies in all contexts to the application and monitoring of systems required to maintain stable mining conditions.

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<td>22.1 Plan and Prepare for the Application of the Design System.</td>
<td>22.1.1 The legislative, statutory and site requirements related to the design system are accessed, identified and interpreted.</td>
</tr>
<tr>
<td></td>
<td>22.1.2 Work group and individual responsibilities and tasks are communicated and clarified.</td>
</tr>
<tr>
<td></td>
<td>22.1.3 Resources required for the application of the design system are identified, obtained and allocated.</td>
</tr>
<tr>
<td></td>
<td>22.1.4 Individual training needs are identified and satisfied through accessing the established design systems, programs and plans.</td>
</tr>
<tr>
<td></td>
<td>22.1.5 Safe operating procedures are accessed and interpreted.</td>
</tr>
<tr>
<td></td>
<td>22.1.6 The risks associated with unstable mining structures are identified and interpreted.</td>
</tr>
<tr>
<td>22.2 Apply the Design System</td>
<td>22.2.1 Approved design system is communicated, applied and monitored.</td>
</tr>
<tr>
<td></td>
<td>22.2.2 Primary, secondary and other support systems are communicated and applied.</td>
</tr>
<tr>
<td></td>
<td>22.2.3 Mining constraints impacting on the maintenance of a stable mining structure are identified and assessed in accordance with the design system.</td>
</tr>
<tr>
<td></td>
<td>22.2.4 Ground support systems are installed, monitored and assessed.</td>
</tr>
<tr>
<td></td>
<td>22.2.5 System failures are identified and assessed.</td>
</tr>
</tbody>
</table>
22.2.6 Mining sequences are applied and monitored in accordance with the design system.

22.2.7 Virgin and induced stress control methods are identified and assessed.

22.2.8 Individual training needs are identified and satisfied through accessing the established design plan, program and systems.

22.2.9 Emergency response and evacuation plans and procedures are applied and monitored throughout the work and reported, where appropriate, in accordance with site requirements.

22.2.10 Safe operating procedures are applied and monitored throughout the work and reported, where appropriate, in accordance with site requirements.

22.2.11 Systems audit and review requirements are contributed to in accordance with the design plan.

22.3 Apply Monitoring and Maintenance Procedures

22.3.1 Inspection, repair and maintenance activities are scheduled and carried out in accordance with design systems.

22.3.2 Maintenance and monitoring requirements and activities are recorded, reported and reviewed in accordance with design systems.

DEFINITIONS

1. Audit is the validation process to ensure the system, procedures and processes meet the established objectives and are implemented.

2. Mine design is the process of engineering analysis applied to the systems and sequences involved in mining.

3. Risk is the chance of something happening that will have an impact upon objectives. It is measured in terms of consequences and likelihood. (AS/NZ 4360: 1995)

4. Hazard is a source of potential harm or a situation with a potential to cause loss.

5. Standard operating procedures (SOP) are also known as safe working procedures, safe operating procedures and standard working procedures.
**RANGE OF VARIABLES**

- Resources may include but are not limited to skilled personnel, rock mechanics underground supports and equipment, power water/gas drainage systems and budgetary requirements.

- Mining systems and methods may include, but are not limited to, bord and pillar, rock casing, outfill, overhand, underhand, place changing, auger mining, pillar extraction and extraction, partial extraction, punch mining, systems of entry.

- Stress includes, but is not limited to, horizontal and vertical tectonic induced stress and mining induced stress.

- Geological and hydrogeological information includes that related to, but not limited to: subsidence, roof and floor technical data, gas content, over and underlying and adjacent rock formations, waterbearing strata, permeability of formations, physical properties, caving characteristics, faults, intrusions and deformities.

- Mine site historical information may include, but not limited to, existence of previous workings within the work seam or other seam, sedimentology aspects of the minesite relating to subsidence, gas content, roof and floor technical data, over and underlying strata, water bearing strata, permeability of formations, hydrology, physical property testing results, caving characteristics.

- Mine design may include in whole or in part requirements relating to footwall and hanging wall competency, mine plant, mining induced stress, ventilation, tunnels, sequencing, drives, shaft sinking, pillar extraction, partial extraction, punch mining, modelling, ore grades, geology, fault management, multi-seams, fault drivage, roof and floor technical data, over and underlying strata, footwall and longwall subsidence and legislative and statutory requirements.

- Mine gases may include seam gases or gases from other introduced sources and may include methane, carbon dioxide, carbon monoxide, oxides of nitrogen, hydrogen, sulphur dioxide, hydrogen sulphide, hydrocarbons and combinations.

- Ore seam characteristics may include, but are not limited to: sulphur content, moisture, Radon gas, friability and depositional factors such as orebody thickness, multiple and rider orebodies, orebody dip and depth of cover.

- Stable structure controls include, but are not limited to, drive size, pillar sizes, depth of cover, and underlying/overlying and adjacent rock formations, stress regimes, strata characteristics, water ingestion, systems of mining and direction of mining.

**EVIDENCE GUIDE**

**CONTEXT**

Competency must be assessed in the normal or simulated work environment within the bounds of safety and in accordance with work procedures.
Assessment shall include those aspects of the core competencies that are consistent with the work environment of this Unit.

Guidelines will be in line with statutory/legal requirements, enterprise specific policies and procedures and codes of practice.

CRITICAL ASPECTS AND EVIDENCE

It is essential that competence is fully observed in the critical aspects of:

- applying personal and operational safety procedures
- interpreting and communicating information on stable mining structures
- identifying and effectively managing risks and hazards associated with stable mining structures
- evaluating mine site and failure mode historical information relating to the maintenance of stable mining structures
- applying exploration techniques
- identifying and assessing geological features
- assessing strata gas characteristics, lithological features and stress regimes
- assessing mining system types and methods
- identifying workplace training/competency requirements
- assessing mining constraints / equipment requirements
- assessing, monitoring and accessing ground support systems
- maintaining the section/district plan
- maintain the selected mining structure
- monitoring mining structure stability

UNDERPINNING KNOWLEDGE

A knowledge of:

- legislative and statutory requirements for mining structures including mine plans, ventilation, gas monitoring, strata support and safety management plans
- the systems of mining including tunnels, drives, shaft sinking, pillar extraction, partial extraction, punch mining and fault drivage.
- stress including mining induced stress, vertical and horizontal stress tectonics.
- sedimentology including subsidence, water bearing strata, permeability of seam and strata, hydrology, physical property testing, caving characteristics, gas content and over and underlying and adjacent rock formations.
- systems of work including board and pillar, place changing, rock casing, auger mining, pillar extraction, partial extension and punch mining.
- mining structure failure modes.
- exploration techniques.
- geology and gas characteristics.
- mining engineering principles.
- ground support systems
- audit methodologies
- historical information
UNDERPINNING SKILLS

The ability to:

- access, interpret and apply technical information
- access and analyse archival and historical mine management information related to the mine and failure mode of mine structures
- interpret and apply design criteria for mine management
- communicate effectively in the workplace
- apply operational procedures relating to mine management
- conduct and report on audits
- identify and evaluate geological and geotechnical information.

RESOURCE IMPLICATIONS

The resources available will be specific to this competency, the individual employer and the particular worksite as required to comply to the other elements of this unit.

Access to a Metalliferous mine using mine design systems.

INTERDEPENDENCE OF UNITS

Interrelationships of units - this unit may need to be applied in conjunction with other relevant units.

COMPETENCY STATEMENT

Competency in this unit needs to be assessed over a period of time to ensure consistency of performance in a range of environments, using a range of assessment instruments.

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### MNMF5FX23A Apply and monitor mine transport systems and production equipment

**STREAM**  | F5 Mine Management Services  
**FIELD**   | FX Mine Management  
**UNIT**    | MNMF5FX23A Apply and monitor mine transport systems and production equipment

This Unit applies in all contexts to the routine operational management functions required to implement production and transport systems and equipment.

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<td>23.1</td>
<td>Plan and Prepare for the Implementation of Production and Transport Systems and Equipment</td>
</tr>
<tr>
<td>23.1.1</td>
<td>The legislative, statutory and site requirements related to production and transport systems are identified and interpreted.</td>
</tr>
<tr>
<td>23.1.2</td>
<td>The purpose of production and transport systems and equipment is identified and confirmed</td>
</tr>
<tr>
<td>23.1.3</td>
<td>Hazards associated with the installation and operation of production and transport systems and equipment are identified, risks evaluated and controls applied.</td>
</tr>
<tr>
<td>23.1.4</td>
<td>Standard operating procedures are accessed and interpreted.</td>
</tr>
<tr>
<td>23.1.5</td>
<td>Roles and responsibilities are identified, clarified and communicated.</td>
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<tr>
<td>23.1.6</td>
<td>Individual training needs are identified through accessing the established transport and production equipment, management training program and systems.</td>
</tr>
</tbody>
</table>

| 23.2    | Apply Systems for the Operation and Maintenance of Production and Transport Systems and Equipment |
| 23.2.1  | Equipment and systems are installed at the work site in accordance with site and manufacturers' requirements. |
| 23.2.2  | Commissioning procedures for production and transport systems and equipment are applied and outcomes reported. |
| 23.2.3  | The impacts of equipment and systems on work processes are assessed and process reviewed, recorded and reported to meet equipment and site requirements. |
23.2.4 Operational and maintenance programs and procedures are applied in accordance with site requirements.

23.2.5 Individual training needs are satisfied through accessing the established transport and production equipment, management training program and systems.

23.2.6 Procedures for reviewing and modifying work processes are applied and monitored.

23.2.7 Emergency response and evacuation plans and procedures are applied and monitored in accordance with site requirements.

23.2.8 Safe operating procedures are applied and monitored throughout the work and reported, where appropriate, in accordance with site requirements.

23.3 Apply Monitoring and Maintenance Procedures

23.3.1 Inspection, repair and maintenance activities are scheduled and carried out in accordance with statutory and site requirements.

23.3.2 Maintenance and monitoring requirements and activities are recorded, reported and reviewed in accordance with statutory and site requirements.

**DEFINITIONS**

For the purposes of this standard, the definition below applies:

- **Audit** is the process by which the validation of procedures, processes and systems is assured.

- **Risk** is the chance of something happening that will have an impact upon objectives. It is measured in terms of consequences and likelihood (AS/NZ 4360: 1995).

- **Hazard** is a source of potential harm or a situation with a potential to cause loss.

Standard operating procedures (SOP) are also known as safe working procedures, safe operating procedures and standard working procedures.

**RANGE OF VARIABLES**

- Transport systems include capacities for personnel, equipment/materials and product and may be wheeled, railed, tracked, skidded or conveyor or product slurry pumped, shaft winding based, pneumatic lifting systems.
• Wheeled transport may include but not be limited to, rubber tyred man transport, multi purpose vehicles, load haul dump, forklifts, front end loader, skid steer loader and grader, bogger or rocker shovel.

• Rail transport may include locomotives (electric/diesel) and rail mounted personnel carriers and rolling stock, drift haulage systems.

• Track vehicles may be fixed or mobile.

• Shaft winding systems may include product, personnel and material and may comprise head gear, cages and skips, winding apparatus and communications, control system discharge and loading facilities, counter balances, Kope winders.

• Conveyor system may include conveyor belts, drive heads, tail ends transfer points, surge bins, inter seam bins and fabricated bins.

• Product slurry pumping may include batching stations, dewatering systems and water reticulation pumping stations.

• Production equipment may include tunnel boring machines, raise borers, boggers, rocker shovels, drill jumbos, face drill rigs, roof bolters (mobile and hand held), rib bolters, auger miners, manual and remote controlled loaders, shotfiring and hydraulic mining.

• Safety information and standards may be contained in legislation and regulations, relevant International/Australian standards, management plans, manager's rules, OH&S policy, codes of practice, industry guidelines, approved standards, manufacturers' instructions, standard operational procedures and job instructions (or equivalent).

• Maintenance may be divided into predictive, preventive and breakdown.

• Site documentation and training policy may include but not be limited to statutory and legislative requirements, management plans and procedures.

• Specifications may include, but not be limited to, performance requirements, costs, dimensions, capacity, OH&S requirements, training requirements and key selection criteria.

**EVIDENCE GUIDE**

**CONTEXT**

Competency must be assessed in the normal or simulated work environment within the bounds of safety and in accordance with work procedures.

Assessment shall include those aspects of the core competencies that are consistent with the work environment of this unit.

Guidelines will be in line with statutory/legal requirements, enterprise specific policies and procedures and codes of practice.

**CRITICAL ASPECTS AND EVIDENCE**
It is essential that competence is fully observed in the critical aspects of:

- applying personal and operational safety procedures
- interpreting and communicating information on production and transport systems operations
- conducting a risk assessment to identify production and transport systems and equipment hazards and risks
- contribute to evaluating and selecting production and transport systems and equipment systems
- implement the training program
- reviewing and auditing the effectiveness of the management plan
- implementing the statutory reporting system
- implementing emergency response procedures

UNDERPINNING KNOWLEDGE

A knowledge of:

- legislative and statutory requirements and instructions including transport rules, maintenance schemes, SOP's, training, statutory testing on diesel vehicles, battery charging, underground fuel depots, conveyor belts.
- mine operation procedures
- geological structures
- mine plans
- mine design relating to production and transport systems and equipment
- production and transport systems and equipment management requirements
- site environmental monitoring requirements
- risk management procedures
- production and transport systems and equipment statutory inspection requirements
- mine reporting procedures
- emergency response and evacuation planning processes and techniques
- maintenance surveys
- audit review processes and techniques
- production and transport equipment and systems; the types, uses, characteristics and limitations appropriate for safe operation at the mine site
- power sources including electrical, hydraulic, pneumatic, diesel
- safety design features of production and transport systems
- safe operating procedures relating to production and transport equipment
- stores system
- specification design criteria including noise, dust, lighting, ergonomics, remote control, physical clearance, confined space, visibility, seating vibration and machine equipment and personal protection training programs.
- specification design criteria including noise, dust, lighting, ergonomics, remote control, physical clearance, confined space, visibility, seating vibration and machine equipment and personal protection
- training programs
- standard operating procedures relating to production and transport equipment
- safety design features for maintenance of production and transport equipment
- computer based systems
- fire fighting systems and precaution rules
UNDERPINNING SKILLS

The ability to:

- access, interpret and apply:
  - technical information
  - briefings and handover details
- assess the risks and consequences attached to production and transport systems and equipment
- implement procedures appropriate to mine operations for management of production and transport systems and equipment
- plan and coordinate work
- identify training needs related to production and transport systems
- interpret and apply manufacturers' instructions
- conduct maintenance surveys.

RESOURCE IMPLICATIONS

The resources available will be specific to this competency, the individual employer and the particular worksite as required to comply to the other elements of this unit.

Access to a Metalliferous mine site using mine transport systems and production equipment.

INTERDEPENDENCE OF UNITS

Interrelationships of units - this unit may need to be applied in conjunction with other relevant units.

COMPETENCY STATEMENT

Competency in this unit needs to be assessed over a period of time to ensure consistency of performance in a range of environments, using a range of assessment instruments.

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<td>7 Using Technology</td>
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</table>
MNMF5FX24A Apply and monitor mine services systems

**STREAM**  F5 Mine Management Services
**FIELD**    FX Mine Management

<table>
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<th>UNIT</th>
<th>MNMF5FX24A Apply and monitor mine services systems</th>
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MNMF5FX24A
This Unit applies in all contexts to the application and monitoring of mine services systems and equipment.

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<td>24.1</td>
<td>Plan and Prepare for the Operation and Maintenance of Mine Services Systems and Equipment</td>
</tr>
<tr>
<td></td>
<td>24.1.1 The legislative, statutory and site requirements related mine services systems are identified and interpreted.</td>
</tr>
<tr>
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<td>24.1.2 The purpose of, mine services systems and equipment are identified and confirmed.</td>
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<td></td>
<td>24.1.3 Hazards associated with the installation and operation of mine services equipment are identified, risks evaluated and controls applied.</td>
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<td></td>
<td>24.1.4 Standard operating procedures are accessed and interpreted.</td>
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<tr>
<td></td>
<td>24.1.5 Individual training needs are identified and satisfied through accessing the established program and systems.</td>
</tr>
<tr>
<td>24.2</td>
<td>Apply and Monitor Systems for the Operation and Maintenance of Mine Services Systems and Equipment</td>
</tr>
<tr>
<td></td>
<td>24.2.1 The impacts of equipment and systems on work processes are assessed and processes reviewed, recorded and reported to meet equipment and mine requirements.</td>
</tr>
<tr>
<td></td>
<td>24.2.2 Operational and maintenance programs and procedures are applied and monitored in accordance with site requirements.</td>
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<tr>
<td></td>
<td>24.2.3 Procedures for reviewing and modifying work processes are applied and monitored.</td>
</tr>
<tr>
<td></td>
<td>24.2.4 Standard operating procedures are applied and monitored throughout the work and reported, where appropriate, in accordance with site requirements.</td>
</tr>
<tr>
<td></td>
<td>24.2.5 Systems audit and review requirements are contributed to in accordance with site and legislative requirements.</td>
</tr>
<tr>
<td></td>
<td>24.2.6 Emergency response and evacuation plans and procedures are applied and monitored in accordance with site requirements.</td>
</tr>
</tbody>
</table>
24.3 Apply Systems Maintenance Procedures

24.3.1 Inspections, repair and maintenance activities are scheduled and carried out in accordance with site requirements.

24.3.2 Maintenance requirements and activities are recorded, reported and monitored in accordance with site requirements.

DEFINITIONS

For the purposes of this standard, the definition below applies:

- Audit is the process by which the validation of procedures, processes and systems are assured.

- Risk is the chance of something happening that will have an impact upon objectives. It is measured in terms of consequences and likelihood (AS/NZ 4360: 1995).

- Hazard is a source of potential harm or a situation with a potential to cause loss.

- Standard operating procedures (SOP) are also known as safe working procedures, safe operating procedures and standard working procedures.

RANGE OF VARIABLES

- Mine services may include, but not be limited to, water, wastewater, compressed air, fire fighting, gas drainage, fuel, electrical and waste disposal, condition monitoring.

- A service system includes the functions of design, development, establishment, installation, operations, protection, maintenance, monitoring and recording and reporting process.

- Ancillary support systems may include, but not be limited to, mine plans, signage, stores system, development drives and openings, maintenance and drilling (raise boring and bore hole) and emergency response systems.

- Emergency response systems: refuge chambers, designated escape ways, alarm systems, guidance systems, emergency communication systems, self aided escape apparatus, mines rescue capability.

- Protection systems may include, but not be limited to, explosion barriers, electrical protection, compressed air protection, hydraulic protection, environment protection (stone dusting and dust suppression) mechanical protection and frictional ignition protection.

- Reticulation may include water management, pumping of solids, fluid reticulation and storage, material reticulation and storage (hydraulic, electric, water and compressed air). Reticulation system may be electrical or mechanical.

- Communication system may include, but not be limited to, oral, phones, radios and telemetry.
- Reporting and recording systems include site requirements and consist of phones, radios, computer systems, verbal and written.

- Safety services may include, but not be limited to, risk assessment process, fire fighting, first aid and mines rescue.

- Safety information and standards may be contained in legislation and regulations, relevant Australian standards, management plans, manager's rules, OH&S policy, codes of practice, manufacturers' instructions and standard working or job procedures (or equivalent), industry guidelines.

- Site documentation and training policy may include, but not be limited to, statutory and/or management systems and procedures.

- Specifications may include, but not be limited to, performance requirements, costs, dimensions, capacity, occupational health and safety requirements, training requirements, and key selection criteria.

**EVIDENCE GUIDE**

**CONTEXT**

Competency must be assessed in the normal or simulated work environment within the bounds of safety and in accordance with work procedures.

Assessment shall include those aspects of the core competencies that are consistent with the work environment of this unit.

Guidelines will be in line with statutory/legal requirements, enterprise specific policies and procedures and codes of practice.

**CRITICAL ASPECTS AND EVIDENCE**

It is essential that competence be fully observed in the critical aspects of:

- applying personal and operational safety procedures
- interpreting and communicating information on mine services systems operations
- conducting a risk assessment to identify mine services systems and equipment hazards and risks
- contributing to the evaluation and selection of mine services systems and equipment
- defining roles and responsibilities for the implementation of mine services systems
- implementing statutory reporting procedures
- developing / modifying work systems and procedures
- implementing the training system
- reviewing and auditing the effectiveness of the mine services operations
- implementing emergency response and evacuation plans and procedures

**UNDERPINNING KNOWLEDGE**

A knowledge of:
• legislative and/or site specific requirements for mine services including, but not limited to, mine plans, electrical rules, compressed air, electrical / mechanical equipment, inspection requirement, environmental management, explosion barriers, communication, emergency procedures, risk management, recording and reporting, mines rescue, OH&S, manufacturers' instructions, standard work procedures, training and fire fighting.
• emergency response and disaster planning processes and techniques
• audit review process and techniques
• mine operating procedures including those applying to transport systems, ore passes and hoisting systems, conveyor systems, systems of mining, ventilation system, gas management and mine water management, concentrate pumping systems
• mine design relating to mine services systems
• power sources including electrical, hydraulic, compressed air, diesel
• safety design features of mine services systems
• computer based systems
• training programs
• fire fighting systems and precaution rules
• safety design features for maintenance of mine services systems
• maintenance surveys
• stores systems.

UNDERPINNING SKILLS

The ability to:

• access, interpret and apply:
  - technical information
  - site/legislative requirements
  - records and reports
  - briefings and handover details
• assess the risks and consequences attached to mine services systems and equipment
• plan and coordinate work
• identify training needs related to mine services systems
• interpret and apply manufacturers' instructions
• conduct maintenance surveys.

RESOURCE IMPLICATIONS

The resources available will be specific to this competency, the individual employer and the particular worksite as required to comply to the other elements of this unit.

Access to a Metalliferous mine site using mine services systems.

INTERDEPENDENCE OF UNITS

Interrelationships of units - this unit may need to be applied in conjunction with other relevant units.

COMPETENCY STATEMENT
Competency in this unit needs to be assessed over a period of time to ensure consistency of performance in a range of environments, using a range of assessment instruments.

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<td>7 Using Technology</td>
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# MNMF5FX25A Apply and monitor mine fixed plant and infrastructure systems

<table>
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<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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<tbody>
<tr>
<td>25.1 Plan and Prepare for the Operation and Maintenance of Fixed Plant and Infrastructure Systems</td>
<td>25.1.1 The legislative, statutory and site requirements fixed plant and infrastructure systems are identified and</td>
</tr>
<tr>
<td></td>
<td>25.1.2 The purpose of fixed plant and infrastructure systems and equipment are identified and confirmed.</td>
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<td></td>
<td>25.1.3 Hazards associated with the installation and operation requirements of fixed plant and infrastructure equipment are identified, risks evaluated and controls applied.</td>
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<tr>
<td></td>
<td>25.1.4 Standard operating procedures are accessed, interpreted and applied.</td>
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<tr>
<td></td>
<td>25.1.5 Individual training needs are identified and satisfied</td>
</tr>
<tr>
<td>25.2 Apply and Monitor Systems for the Operation and Maintenance Fixed Plant and Infrastructure Systems</td>
<td>25.2.1 The impacts of equipment and systems on work</td>
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<tr>
<td></td>
<td>25.2.2 Operational and maintenance programs and procedures are applied according to site maintenance requirements.</td>
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<td></td>
<td>25.2.3 Procedures for reviewing and modifying work processes are applied and monitored. Standard operating procedures are applied and monitored throughout the work and reported, where appropriate, in accordance with site requirements.</td>
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<td></td>
<td>25.2.4 Emergency response and evacuation plans and</td>
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<td></td>
<td>25.2.5 Systems audit and review requirements are contributed to in accordance with site and legislative requirements.</td>
</tr>
</tbody>
</table>
25.3 Apply Systems Maintenance Procedures

25.3.1 Inspections, repair and maintenance activities are
recorded, reported and monitored in accordance with site requirements.

25.3.2 Maintenance requirements and activities are
recorded, reported and monitored in accordance with site requirements.

DEFINITIONS

For the purposes of this standard, the definition below applies:

- Audit is the process by which the validation of procedures, processes and systems are assured.

- Risk is the chance of something happening that will have an impact upon objectives. It is measured in terms of consequences and likelihood (AS/NZ 4360: 1995).

- Hazard is a source of potential harm or a situation with a potential to cause loss.

- Standard operating procedures (SOP) are also known as safe working procedures, safe operating procedures and standard working procedures.

RANGE OF VARIABLES

- Infrastructure may include, but is not limited to, fabrication and construction areas, servicing areas, refuelling points, workshops, dams, explosives magazines, training facility, bathrooms, HV switch rooms, lamp cabin, laboratory, storehouses, equipment storage areas, on site residential housing, site access (road, rail, air), battery rooms, water treatment plant, sewerage treatment plant, offices, emergency facilities (first aid, fire and rescue), mineral processing plant, stockpile and concentrate handling.

- Fixed plant and equipment, may include but not be limited to, lathes, presses, gantry cranes, drills, grinders, service bays, testing rooms, process treatment plant, drive heads, pumps and stations, pipelines, ventilation fans, compressors, winders, haulage winches, battery chargers, air conditioning, generators, electrical switching / control / distribution equipment and gas plant.

- Safety systems may include, but not be limited to, legislation (legal requirements), location, site layout, purpose, environmental control (gas, noise, water, heat, dust), protection systems (guarding, fire protection and suppression, electricity, lightning arresters, ventilation in explosives magazines and earthing).

- Reporting and recording systems include site requirements and consist of phones, radios, computer systems, verbal and written.

- Safety information and standards may be contained in legislation and regulations, relevant Australian standards, management plans, manager's rules, OH&S policy, codes of practice,
manufacturers' instructions, standard working or job procedures (or equivalents), codes of practice and industry guidelines.

- Site documentation and training policy may include, but not be limited to, statutory and legislative requirements, management plans and procedures.

- Specifications may include, but not be limited to, performance requirements, costs, dimensions, capacity, OH&S requirements, training requirements and key selection criteria.

**EVIDENCE GUIDE**

**CONTEXT**

Competency must be assessed in the normal or simulated work environment within the bounds of safety and in accordance with work procedures.

Assessment shall include those aspects of the core competencies that are consistent with the work environment of this unit.

Guidelines will be in line with statutory/legal requirements, enterprise specific policies and procedures and codes of practice.

**CRITICAL ASPECTS AND EVIDENCE**

It is essential that competence is fully observed in the critical aspects of:

- applying personal and operational safety procedures
- interpreting and communicating information on fixed plant and equipment and infrastructure.
- conducting a risk assessment to identify fixed plant and equipment and infrastructure hazards and risks
- contributing to evaluating and selecting fixed plant, equipment and infrastructure systems
- defining roles and responsibilities for management of fixed plant and equipment and infrastructure
- implementing the training program
- reviewing and auditing the effectiveness of the fixed plant and infrastructure systems
- implementing statutory inspections and reporting
- developing / modifying work systems and procedures
- implementing emergency response and evacuation plans and procedures

**UNDERPINNING KNOWLEDGE**

A knowledge of:

- legislative, statutory, Australian standards and site specific requirements for plant and infrastructure including, but not limited to, mine plan, electrical rules, electrical / mechanical equipment, communications, emergency procedures, risk management, recording and reporting, mines rescue, OH&S, manufacturers' instructions, standard work procedures, training, fire fighting, handling and storage of dangerous goods, local government requirement and local power authority
• mine operation systems and procedures including transport systems, conveyor systems, systems of mining, ventilation system(s), gas management systems and mine water management systems
• stores systems
• development drives and openings maintenance
• protection systems
• reticulation systems
• specifications for fixed plant and infrastructure
• audit processes
• mine design principles and procedures relating to fixed plant and infrastructure systems
• power sources including electrical, hydraulic, pneumatic and diesel
• computer based systems
• training programs
• fire fighting systems and precaution rules
• safety design features for maintenance of fixed plant and infrastructure
• maintenance surveys.

UNDERPINNING SKILLS

The ability to:

• access, interpret and apply:
  7 technical information
  8 site/legislative requirements
  9 records and reports
  10 briefings and handover details
• assess the risks and consequences attached to fixed plant and infrastructure systems and equipment
• develop procedures appropriate to mine operations for management of fixed plant and infrastructure systems and equipment
• plan and coordinate work
• identify training needs related to fixed plant and infrastructure systems
• interpret manufacturers' instructions
• conduct maintenance survey.

RESOURCE IMPLICATIONS

The resources available will be specific to this competency, the individual employer and the particular worksite as required to comply to the other elements of this unit.

Access to a Metalliferous mine site using mine fixed plant and infrastructure systems.

INTERDEPENDENCE OF UNITS

Interrelationships of units - this unit may need to be applied in conjunction with other relevant units.

COMPETENCY STATEMENT
Competency in this unit needs to be assessed over a period of time to ensure consistency of performance in a range of environments, using a range of assessment instruments.

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</table>
**MNMF5FX26A Apply and monitor emergency preparedness and response systems**

**STREAM**  
F5 Mine Management Services

**FIELD**  
FX Mine Management

**UNIT**  
MNMF5FX26A Apply and monitor emergency preparedness and response systems

This Unit applies in all contexts to the application and monitoring of the mine emergency preparedness and response systems and/or plans

<table>
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<th>ELEMENT</th>
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<tbody>
<tr>
<td>26.1 Plan And Prepare For The Implementation Of The Emergency Preparedness And Response Plans.</td>
<td>1 The statutory and/or site requirements related to emergency preparedness and response management are identified and interpreted.</td>
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<td>26.1.2 The emergency preparedness and response systems/plans are accessed, interpreted and clarified.</td>
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<td>26.1.3 Roles and responsibilities, as specified in the emergency preparedness and response plans are identified and clarified.</td>
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<td>26.1.4 Work Group and individual responsibilities and tasks are communicated and clarified in an effective and timely manner.</td>
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<tr>
<td></td>
<td>26.1.5 Resources required for the application of the emergency preparedness and response plans are identified, obtained and allocated.</td>
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<td>26.1.6 Individual training needs are identified and satisfied through accessing the established emergency preparedness and response training program and systems.</td>
</tr>
<tr>
<td>26.2 Apply The Emergency Preparedness And Response Plans</td>
<td>26.2.1 Incident information is received and communicated in accordance with the emergency plan.</td>
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<td>26.2.2 The nature and scope of the incident is assessed and communicated in accordance with the emergency plan.</td>
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<tr>
<td></td>
<td>26.2.3 Emergency response and evacuation plans and procedures are applied and monitored in accordance with the emergency plan.</td>
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</tbody>
</table>
26.2.4 Procedures for monitoring, recording and reporting on emergency incidents are applied according to the emergency plan.

5 Procedures for the collection and analysis of emergency preparedness and response data are applied.

26.2.6 Action plans to manage the situation/incident are contributed to in accordance with the emergency plan.

26.2.7 Action plans are applied and monitored in accordance with the emergency plan.

26.2.8 Incident information is communicated in accordance with the emergency plan.

26.2.9 Audit and review requirements are contributed to in accordance with the emergency plan.

26.3 Apply Maintenance Procedures

26.3.1 Inspections, repair and maintenance activities are scheduled and carried out in accordance with the emergency preparedness and response plans.

26.3.2 Maintenance requirements and activities are recorded, reported and reviewed in accordance with the emergency preparedness and response plans.

**DEFINITIONS**

For the purposes of this standard, the definition below applies:

- Audit is the process by which the validation of procedures, processes and systems are assured.

- Risk is the chance of something happening that will have an impact upon objectives. It is measured in terms of consequences and likelihood (AS/NZ 4360: 1995).

- Hazard is a source of potential harm or a situation with a potential to cause loss.

- Standard operating procedures are also known as safe working procedures, safe operating procedures, job safety analysis and standard working procedures.

- Post-incident management is the control of activities arising from an incident and can include: legal advice, environmental aspects, CISD, interviewing, investigations, witness interview
statements, restoration of normal operations, media releases, public relations, employee
welfare and family support, security of evidence, liaison with statutory/legal bodies, statutory
investigations, review of emergency procedures, documentation of ongoing operations,
restoration of emergency preparedness.

**RANGE OF VARIABLES**

- Types of incident can be identified as, but not limited to: minor accident, major accident or
  fatality, underground explosion or fire, ignition, rockburst; spontaneous combustion, surface
  fire which disrupts operations, environmental incidents, bomb threat, terrorist attack.

- Incidents can be caused by, but are not limited to: explosion, fire, roof fall, strata, inrush,
  rockburst, irrespirable atmosphere, environmental incident, hazchem; explosives, vehicle
  accidents, wall collapse.

- Stakeholders can include, but are not limited to: shareholders, board of directors, employees,
  unions, families, contractors, insurance companies, suppliers, local community,
  manufacturers, Inspectorate, police, Mines Rescue Service, fire brigades, ambulance, medical
  staff, hospitals; critical incident stress debriefing organisations, local emergency management
  organisations, salvation army, clergy, state, federal and local government.

- Required services and resources can include, but are not limited to: internal mine services
  and resources, contractors, insurance companies, suppliers, local community, manufacturers,
  inspectorate, police, Mines Rescue Service, fire brigades, ambulance, medical staff, hospitals,
  critical incident stress debriefing organisations, local emergency management organisations,
  salvation army, clergy, state, federal and local government, media, coroner's representative,
  security services, solicitors, district check inspector, other mines, experts such as engineers,
  scientists, inertisation, down-hole camera, drill rigs, forensic.

- Communications can include radio, telephone, telemetry, verbal, written, computers, runners.

- Equipment refers to that needed to control the incident and includes but is not restricted to
  rescue equipment, mining equipment, transport, specialised equipment from external sources,
  monitoring and analysis equipment.

- Media can include radio, print media, television.

- Operations facilities are those which are set up to manage an incident and can include, but are
  not restricted to operations centre, press room, mortuary, muster areas, meeting rooms,
  communications centres and networks.

- Future operations can include, but are not restricted to sealing mine areas, restoration to full
  production, suspension of operations, full closure of mine.

**EVIDENCE GUIDE**

**CONTEXT**
Competency must be assessed in the normal or simulated work environment within the bounds of safety and in accordance with work procedures.

Assessment shall include those aspects of the core competencies that are consistent with the work environment of this unit.

Guidelines will be in line with statutory/legal requirements, enterprise specific policies and procedures and codes of practice.

**CRITICAL ASPECTS AND EVIDENCE**

It is essential that competence is fully observed in the critical aspects of:
- applying personal and operational safety procedures
- interpreting and communicating information on implementing emergency preparedness and response plans.
- identifying and responding to risks and hazards
- interpreting the contents of mine emergency preparedness and response plans.
- implementing and communicating emergency preparedness and response procedures
- responding to incidents
- interpreting changes to mine emergency preparedness and response systems
- implementing changes to mine emergency preparedness and response system
- reviewing emergency preparedness and response plans performance
- auditing emergency preparedness and response systems performance
- implementing and auditing emergency preparedness and response training programs

**UNDERPINNING KNOWLEDGE**

A knowledge of:
- legislative and statutory requirements for emergency preparedness and response systems
- legislation applicable to mines.
- emergency response planning processes and techniques
- audit review process and techniques
- training and assessment principles.
- industry and legislative stakeholders.
- mine incidents and risks
- classification of incidents.
- structure of emergency procedures guidelines.
- legal requirements of incident management teams.
- hazard identification.
- self-escape philosophies, systems and equipment.
- risk management principles and techniques.
- structure of emergency organisations
- structure, roles, capabilities and limitations of external services and agencies relevant to emergency preparedness and response
- rescue team structure, procedures and equipment.
- standby team requirements
- intervention and control techniques for spontaneous combustion, fires, explosions, rockburst, extrication or inrushes
• the effects of heat and humidity.
• the effects of visibility.
• ventilation and its influence on incidents
• deployment of staff underground.
• escape strategies and technology.
• environmental risks and controls.
• equipment requirements for different types of emergency.
• call-out procedures.
• emotional effects of emergencies on rescuers and mine personnel.
• titles and roles of members of incident management team.
• the requirements and structure for fresh air base.
• legal implications of incidents.
• the role of stakeholders.
• numbers needed to run the mine at planned operational levels.
• equipment handling.
• economic considerations and decisions.
• insurance policies and considerations.
• mine closure procedures and the legislative implications.
• sealing procedures and the legislative implications.

UNDERPINNING SKILLS

The ability to:

• access, interpret and apply technical information relevant to emergency preparedness and response
• access and analyse emergency preparedness and response information related to the mine
• interpret and apply design criteria for emergency preparedness and response systems and plans
• collect, collate and interpret incident/emergency data
• carry out fault-tree analyses.
• conduct enquiries / investigations and prepare reports
• communicate effectively in the workplace
• access, interpret and apply data from monitoring systems and equipment
• operate hand held monitoring equipment
• implement the emergency preparedness and response training program
• apply risk management processes and techniques

RESOURCE IMPLICATIONS

The resources available will be specific to this competency, the individual employer and the particular worksite as required to comply to the other elements of this unit.

Access to a Metalliferous mine site using emergency preparedness and response systems.

INTERDEPENDENCE OF UNITS
Interrelationships of units - this unit may need to be applied in conjunction with other relevant units.

COMPETENCY STATEMENT

Competency in this unit needs to be assessed over a period of time to ensure consistency of performance in a range of environments, using a range of assessment instruments.

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MNMF5FX27A Facilitate the risk management process

This Unit applies in all contexts to the actions taken to facilitate and coordinate the risk management process for a site/area including the application of local and formal risk assessment and control.

<table>
<thead>
<tr>
<th>ELEMENT</th>
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</table>
| 27.1 Determine the Process. | 27.1.1 Process to be used for risk assessment, in line with company policies and management procedures and practices, is identified and determined.  
27.1.2 Parameters of the task of risk management to be carried out are identified, developed and documented.  
27.1.3 Data required to complete the tasks is accessed, interpreted and applied in accordance with site requirements.  
27.1.4 Safety information and procedures are accessed and applied throughout the work. |
| 27.2 Identify Hazards. | 27.2.1 Types of potential hazards to be examined are identified and confirmed by reference to site circumstances and history/precedence.  
27.2.2 Process is broken into steps or parts for detailed hazard identification.  
27.2.3 Potential variations from the existing process, which may result from known work practices or changes to systems/technology are added to the process definition.  
27.2.4 The steps or parts of the process are analysed and loss scenarios (hazards described as incidents or accidents) are identified and recorded/documentated. |
| 27.3 Assess Risk. | 27.3.1 Likelihood of the event (loss scenario) happening is determined.  
27.3.2 Consequence, if the event (loss scenario) should occur, is analysed and determined.  
27.3.3 Risk level of the loss scenario (likelihood and...
27.4 Identify Unacceptable Risk.

27.4.1 Site criteria for assessing the acceptability of risks is sourced or determined in conjunction with the appropriate party.

27.4.2 Risk level or score is determined by the application of the approved site criteria.

27.4.3 Expert advice is sought to clarify findings which are ambiguous, unclear or of doubtful accuracy.

27.5 Identify Potential Actions.

27.5.1 Existing controls are identified.

27.5.2 The range of actions which may be appropriate for the situation are identified, analysed and documented.

27.5.3 Possible options for resolution of problems are identified from consideration of their operational effectiveness in terms of elimination, substitution, engineering and administrative control potential.

27.5.4 Feasible options are identified by preliminary analysis and testing of possible options including their potential to provide the most satisfactory integrated response to the range of issues.

27.6 Decide on Action.

27.6.1 Most appropriate action for the situation is selected from the feasible options.

27.6.2 The selected course of action is confirmed following a detailed analysis of resource requirements, cost, safety and welfare issues.

27.6.3 The selected course of action is documented in accordance with site requirements.

27.7 Implement or Facilitate Action.

27.7.1 The course of action is implemented directly or facilitated through others including the raising and issuing of SOPs.

27.7.2 Safety rules and regulations, including mine managers rules or schemes, legislation and site specific instructions are observed and applied through operations.

27.7.3 Relevant information related to the new/revised SOPs and their implementation is communicated to all interested and involved parties.
27.8 Review the Implementation of Action.

27.8.1 A system of ongoing process review is determined and facilitated to ensure that controls and procedures have been implemented in accordance with the outcomes of the risk assessment and the SOPs.

27.8.2 Processes, actions and controls are reviewed to ensure continuing effectiveness in the changing work environment.

27.8.3 Anomalies and shortcomings disclosed during the review process are responded to or referred to the appropriate party for follow-up action.

27.9 Audit the Risk Management Process.

27.9.1 Risk management processes, including Standard Operating Procedures and implementation processes are formally audited to ensure compliance and effectiveness.

27.9.2 Changed requirements disclosed during audits are responded to in a systematic and timely manner.

27.9.3 Risk management documentation covering the reasons for and changes made are completed and retained to site and relevant statutory requirements.

27.10 Complete Records and Reports.

27.10.1 All risk management documentation and reports are produced, processed and maintained as specified by legislative and site requirements.

DEFINITIONS

For the purpose of this standard, the definitions below apply (AS/NZS 4360: 1995):

- **Consequence**: the outcome of an event of situation expressed qualitatively or quantitatively, being a loss, injury, disadvantage or gain.

- **Cost**: of activities, both direct and indirect, involving any negative impact, including money, time, labour, disruption, goodwill, political and intangible losses.

- **Frequency**: a measure of likelihood expressed as the number of occurrences of an event in a given time.

- **Hazard**: a source of potential harm or a situation with a potential to cause loss.

- **Likelihood**: used as a qualitative description of probability and frequency.

- **Loss**: any negative consequence, financial or otherwise.
Monitor: to check, supervise, observe critically, or record the progress of an activity, action or system on a regular basis in order to identify change.

Probability: the likelihood of a specific outcome, measured by the ratio of specific outcomes to the total number of possible outcomes. Probability is expressed as a number between 0 and 1, with 0 indicating an impossible outcome and 1 indicating an outcome is certain.

Risk: the chance of something happening that will have an impact upon objectives. It is measured in terms of consequences and likelihood.

Risk Acceptance: an informed decision to accept the likelihood and the consequences of a particular risk.

Risk Analysis: a systematic use of available information to determine how often specified events may occur and the magnitude of their likely consequences.

Risk Assessment: the process used to determine risk management priorities by evaluating and comparing the level of risk against predetermined standards, target risk levels or other criteria.

Risk Avoidance: an informed decision not to become involved in a risk situation.

Risk Control: that part of risk management which involves the provision of policies, standards and procedures to eliminate, avoid or minimise adverse risks facing an enterprise.

Risk Identification: the process of determining what can happen, why and how.

Risk Management: the systematic application of management policies, procedures and practices to the tasks of identifying, analysing, assessing, treating and monitoring risk.

RANGE OF VARIABLES

Parameters of the risk management task may include objectives, system boundaries, hazard and consequence types, methods, team processes, timings, venue/locations and consultation processes.

Risk control systems and measures include those focused on personal safety (eg., personal protective equipment, medical standards, drug and alcohol, stress management and evacuation), equipment and machinery isolation, protection and guarding, hazard identification and monitoring, chemical safety, fire safety and other potential emergency related circumstances.

Safety information and procedures may be contained in legislation and regulations, relevant Australian standards, management plans, manager's rules, OH&S policy, codes of practice, manufacturer's instructions, safe working or job procedures (or equivalent).

The criteria for acceptable risk must be determined by the organisation's internal policy, goals and/or objectives.
• Hazards in the workplace may involve equipment, methods/plans, competencies and/or the work environment.

• Controls for hazards should be considered using option types in sequence from eliminating the hazard, substitution, engineering controls, administrative controls (procedures, etc.) and, finally PPE.

• Records and reports for Risk Assessment may include a full report including Objective, Method, Results and Recommendations, the Risk Assessment Forms, Action Planning documents, etc.

• Site policy, objectives, rules and procedures will vary from site to site.

EVIDENCE GUIDE

CONTEXT

Competency must be assessed in the normal or simulated work environment within the bounds of safety and in accordance with work procedures.

Assessment shall include those aspects of the core competencies that are consistent with the work environment of this unit.

Guidelines will be in line with statutory/legal requirements, enterprise specific policies and procedures and codes of practice.

CRITICAL ASPECTS AND EVIDENCE

It is essential that competence is fully observed in the critical aspects of:
• applying operational safety requirements
• interpreting and communicating operational hazard-related information
• scoping risk assessment projects
• breaking processes or functions into clear steps or components
• identifying and understanding hazards
• analysing risks
• identifying best available control options to address an unacceptable risk
• maintaining records and reports such as the Risk Assessment reports and forms
• coordinating and monitoring actions and responding to changing situations

UNDERPINNING KNOWLEDGE

A knowledge of:
• operational safety requirements
• relevant site and equipment safety requirements
• statutory and site rules, policies, procedures and regulations
• personal safety measures
• the Risk Management Process
• Risk Assessment scoping methods to determine the process
• Risk Assessment method, including:
  – identifying hazards
  – assessing risks
  – determining acceptability of risks
  – identifying existing controls
  – determining adequacy of current controls
  – identifying new potential controls
• Risk Assessment documentation method
• method of identifying appropriate action based on cost, safety and welfare issues
• Action Planning method
• monitoring and auditing methods
• communication methods, written and oral
• interviewing techniques
• reporting and recording procedures.

UNDERPINNING SKILLS

The ability to:

• read, interpret, apply and communicate technical information, rules, procedures, regulations, etc.
• provide leadership and guidance for group activities (facilitator)
• communicate effectively in the workplace
• interview process participants
• facilitate and document a scoping session for a Risk Assessment
• facilitate a Risk Assessment exercise
• be involved in a Risk Assessment exercise as a team member
• proactively identify hazards
• analyse the hazard to identify and score the risk
• select an appropriate action to reduce unacceptable risks
• document the Risk Assessment
• write effective Risk Assessment Reports
• maintain relevant records and documents
• monitor and recommend changes to process

RESOURCE IMPLICATIONS

The resources available will be specific to this competency, the individual employer and the particular worksite as required to comply to the other elements of this unit.

Access to a Metalliferous mine site using risk management processes.

INTERDEPENDENCE OF UNITS
Interrelationships of units - this unit may need to be applied in conjunction with other relevant units.

COMPETENCY STATEMENT

Competency in this unit needs to be assessed over a period of time to ensure consistency of performance in a range of environments, using a range of assessment instruments.

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<thead>
<tr>
<th>KEY COMPETENCY</th>
<th>LEVEL</th>
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<tr>
<td>1 Collecting, Analysing and Organising Information</td>
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<tr>
<td>2 Communicating Ideas and Information</td>
<td>2</td>
</tr>
<tr>
<td>3 Planning and Organising Activities</td>
<td>2</td>
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<tr>
<td>4 Working with Others in Teams</td>
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<tr>
<td>5 Using Mathematical Ideas and Techniques</td>
<td>2</td>
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<tr>
<td>6 Solving Problems</td>
<td>2</td>
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<tr>
<td>7 Using Technology</td>
<td>2</td>
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</tbody>
</table>
**General Management - Units of Competency**

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<td>Establish and manage environmental management policies, plans and procedures</td>
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<td>MNIL03A</td>
<td>Establish and manage the management information system</td>
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<td>MNIL13A</td>
<td>Initiate, monitor and supervise contracts</td>
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<td>MNIL14A</td>
<td>Establish and implement operational management plans</td>
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<td>MNIL15A</td>
<td>Manage customer service</td>
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<td>Conduct business negotiations</td>
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</tr>
</tbody>
</table>
**MNIL02A Establish and manage environmental management policies, plans and procedures**

**Description:** This unit covers the management of activities associated with environmental management policies, plans, procedures and programs. Its application provides for the management of the environmental management policies, plans, procedures and programs from establishment of the mine site, through to the operation and closure of the mine site.

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<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
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<tr>
<td>L2.1 Gather Environmental Management Information.</td>
<td>L2.1.1 Conduct community, enterprise and stakeholder consultation.</td>
</tr>
<tr>
<td></td>
<td>L2.1.2 Issues raised through consultation are addressed and incorporated into the policy and plan development.</td>
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<tr>
<td></td>
<td>L2.1.3 Read, review and interpret the enterprise environmental policies and plans against current legislation and perceived stakeholder attitudes and expectations.</td>
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<tr>
<td></td>
<td>L2.1.4 Identify all stakeholders and their relationship with the enterprise and their impact or relationship with the policies and plans.</td>
</tr>
<tr>
<td></td>
<td>L2.1.5 Establish the available resources to implement the policies and plans.</td>
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<tr>
<td></td>
<td>L2.1.6 Confirm the responsibilities and authorities as outlined in the policies and plans.</td>
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<td></td>
<td>L2.1.7 Establish procedures for the implementation of the management plans.</td>
</tr>
<tr>
<td>L2.2 Identify Environmental Impacts and Assess Risks.</td>
<td>L2.2.1 Existing and potential events that may affect the environment are identified, quantified and reported.</td>
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<tr>
<td></td>
<td>L2.2.2 Existing environmentally sensitive sites, including heritage and sacred sites, are identified and recorded.</td>
</tr>
<tr>
<td></td>
<td>L2.2.3 Existing and potential environmental management risks are identified, quantified and reported.</td>
</tr>
<tr>
<td></td>
<td>L2.2.4 Work activities, which may cause damage to the environment, are identified, quantified and reported in accordance with enterprise procedures.</td>
</tr>
</tbody>
</table>
L2.3 Develop Environmental Management Policies and Plans.

L2.3.1 Environmental management processes and required workplace procedures are identified and incorporated into the policy and plan development.

L2.3.2 Reviews and audits identified are incorporated into the management plan.

L2.3.3 Management policies and plans are prepared and presented.

L2.4 Implement and Monitor Environmental Policies and Plans.

L2.4.1 Environmental management plans, processes and workplace procedures are developed and implemented, to achieve policy and plan objectives and performance criteria.

L2.4.2 Monitor effectiveness of policies and plans against objectives, timelines and key performance indicators.

L2.4.3 Audit environmental management processes and workplace procedures.

L2.4.4 Review and modify processes and procedures to achieve policy and plan objectives.

L2.5 Implement and Monitor the Procedures for Managing Environmental Impacts and Controlling Risks.

L2.5.1 Work procedures to manage risks are implemented and adherence to them is monitored to achieve the policy and plan objectives.

L2.5.2 Inadequacies in risk management measures are identified, reported to the appropriate authority, and remedied in accordance with enterprise procedures.

L2.5.3 Risk management measures are monitored and results reported in accordance with workplace procedures.

L2.5.4 Environmental impacts are quantified and recorded in accordance with legislative requirements and workplace procedures.

L2.5.5 Adverse environmental impacts are reported and recommendations made to minimise the impacts, in accordance with enterprise and legislative requirements.

L2.6 Implement and Monitor Procedures for Managing Environmental Incidents.

L2.6.1 Workplace procedures for managing incidents of environmental significance/harm are implemented to ensure prompt control and remediation.

L2.6.2 Incidents of environmental impact are
investigated to identify their cause in accordance with investigation procedures or environmental audit requirements.

L2.6.3 Control measures to prevent recurrence and minimise risks of events are implemented in accordance with the environmental policy and/or plan.

L2.6.4 Incidences of environmental impact/significance/harm are recorded and reported in accordance with enterprise procedures and legislative requirements.

L2.7 Maintain Environmental Records.

L2.7.1 Environmental management records for the site area are accurately and legibly completed in accordance with workplace requirements and legislative requirements.

L2.7.2 Environmental records are stored for easy access and review in accordance with the policy and plan requirements.

L2.7.3 Environmental records are regularly reviewed and assessed to identify long term trends and impacts.

L2.7.4 Results of record reviews are reported in accordance with the policy and plan requirements.


L2.8.1 The management policies are reviewed against established objectives.

L2.8.2 The management plans are reviewed against established key performance indicators.

L2.8.3 Policies and plans are reviewed against prevailing community attitudes and expectations, through consultation.

L2.8.4 Policies and plans are modified to incorporate changes identified and required.

L2.8.5 Modified environmental policies and plans are implemented.
DEFINITION OF TERMS

For purposes of consistency, the following definitions have been applied in this standard.

**Definition of terms taken from AS/NZS ISO 14001: 1996**

**environment**

surroundings in which an organisation operates, including air, water, land, natural resources, flora, fauna, humans, and their interrelation

**environmental management system**

The part of the overall management system that includes organisational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the environmental policy

**environmental management system audit**

A systematic and documented verification process of objectively obtaining and evaluating evidence to determine whether an organisation's environmental management system conforms to the environmental management system audit criteria set by the organisation, and for communication of the results of this process to management

**continual improvement**

process of enhancing the environmental management system to achieve improvements in overall environmental performance in line with the organisation's environmental policy

**environmental performance**

Measurable results of the environmental management system, related to an organisation's control of its environmental aspects, based on its environmental policy, objectives and targets

**environmental objective**

Overall environmental goal, arising from the environmental policy, that an organisation sets itself to achieve, and which is quantified where practicable

**environmental aspect**

element of an organisation's activities, products or services that can interact with the environment

**environmental impact**

any change to the environment, whether adverse or beneficial, wholly or partially resulting from and organisation's activities, products or services

**environmental policy**

Statement by the organisation of its intentions and principles in relation to its overall environmental performance which provides a framework for action and for the setting of its environmental objectives and targets
environmental target  Detailed performance requirement, quantified where practicable, applicable to the organisation or parts thereof, that arises from the environmental objectives and that needs to be set and met in order to achieve those objectives

organisation  Company, corporation, firm, enterprise, authority or institution, or part or combination thereof, whether incorporated or not, public or private, that has its own functions and administration

interested party  Individual or group concerned with or affected by the environmental performance of an organisation

prevention of pollution  Use of processes, practices, materials or products that avoid, reduce, or control pollution, which may include recycling, treatment, process changes, control mechanisms, efficient use of resources and material substitution

RANGE OF VARIABLES

This competency standard is applicable for those with managerial responsibility.

To be exhibited in the work area of responsibility which may include the establishment, operation and/or closure of a minesite.

Involves relevant legislation and codes of practice, and the maintenance of records, provision of information and training and the dealing with committees, statutory/legal agencies and site personnel.

Processes for consultation include committees, consultation with statutory/legal agencies/site representatives, issue resolution procedures and participative/consultative procedures conducted by supervisory staff within the area of managerial responsibility.

Monitoring of activities may include review of written reports, performance appraisal or auditing procedures.

Sensitive Areas may include:
- Sacred sites
- Heritage areas.

Statutory/legal compliance may include but is not limited to:
- trade practices
- weights and measures
- waterways
- workers compensation/workcover
- planning and assessment
- local government
- dangerous goods
- industry licensing
• industrial relations
• navigation
• mines act
• common law
• environmental protection
• nature conservation
• mineral resources
• development of training policies/programs to aid compliance.

**In accordance with all relevant statutory/legal requirements, particularly:**
• requirements for the maintenance of records for statutory/legal breaches
• provision of information and training
• regulations and codes of practice relating to statutory/legal compliance
• site representatives and committees
• issue resolution.

**Management operates within:**
• work schedules may include shift work and varying hours of duty
• environments ranging from simple to complex and diverse
• appropriate policies, guidelines and processes
• a level of autonomy which may range from limited to substantial.
• quality and continuous improvement processes and standards
• business and performance plans
• ethical standards established by the organisation
• productivity and profitability objectives and targets
• best practice and benchmarking principles and practices
• legislation, codes and practices
• resource parameters which may be defined or negotiated
• training and development principles and practices
• human resource policies and practices including interviewing, counselling, dispute settling and discipline
• enterprise/industrial agreements/awards.

**Management may assume varying roles including:**
• leader
• coach
• facilitator
• mentor
• participant
• director
• trainer
• assessor.

**Management will typically make decisions to:**
• maintain statutory/legal compliance
• influence operational performance
• plan production schedules
• maximise production and minimise operating costs/risks and non-conformances
• analyse and review market/production predictions and costs
• manage projects and tasks
• co-ordinate resources - human, financial and physical.

Resources may include, but are not limited to:
• people
• finance
• equipment
• environment
• buildings/facilities
• technology
• information.

Negotiations may be with a variety of internal or external sources and be:
• formal or informal
• short term or ongoing
• multi-lingual and cross-cultural
• enterprise agreements
• legislation regulation compliance and include relative authorities, project managers, employees, contractors, customers and the community.

Legislative compliance will typically involve:
• mines department/mineral resources or appropriate body
• occupational health and safety
• environmental authority
• state/federal/local government authorities
• dangerous goods.

Consultation would typically include:
• regulatory authorities
• tenderers
• project managers
• contractors
• employees
• community
• customers
• suppliers
• employees representatives
• specialist professionals.

**EVIDENCE GUIDE**

This guideline is to assist the development of assessment instruments/tools to assess the competence of mining managers. At this level, mining managers must provide evidence of consistent achievement of this Unit's workplace outcomes.
1. **Context of Assessment**

Leadership and Management competency development in the Industry is to be designed to optimise aided learning of the essential underpinning knowledge and mentored workplace development of application skills.

The context of summative assessment should, to the maximum possible extent, be integrated with real work activities being completed by the candidate.

Summative assessment of underpinning knowledge, to the extent it is required, and formative assessment of application skills may be conducted through simulations.

2. **Interdependent Assessment of Units**

Within the Leadership and Management competency suite, there are a range of units which lend themselves to holistic assessment strategies.

This unit covers ten primary functions or outcomes being the gathering of environmental information, identifying environmental impacts, assessing risks, identifying controls, developing, implementing and monitoring environmental policies, plans and procedures, maintaining environmental records and reviewing and refining these policies, plans and procedures. It therefore represents the review activity which may result in a range of other management and technical competencies being invoked.

For these reasons, it would be normal for the assessment of this unit to be handled as an individual entity.

3. **Critical Aspects of Evidence.** The Industry has established that, for portability purposes, it is essential that competency in this unit reflects successful assessment in the critical aspects of behaviours and outcomes which require the candidate to:

- determine and select evaluation measures and criteria for a significant mine environmental function or activity
- establish and manage environmental activities
- manage environmental risk
- prepare formal environmental evaluation reports
- present environmental evaluation results to stakeholders
- manage the linking of environmental evaluation outcomes with follow-up planning and management processes.

4. **Consistency of Performance.** Consistency of performance in this unit is aided by the standards of performance which are contained within State Legislation and by professional standards and practices established and observed by the Industry.

### UNDERPINNING KNOWLEDGE

5. **A knowledge of the listed topics/disciplines in sufficient scope and depth to enable the candidate to establish and manage environmental policies, plans and procedures.**

**A knowledge of:**
• environmental statutory and site rules, policies, procedures and regulations
• risk management processes and techniques
• advanced communication techniques
• strategic planning
• corporate planning model and techniques
• corporate, group and individual goal selling techniques
• industrial awards/enterprise agreements
• occupational health and safety.

UNDERPINNING SKILLS

6. The ability to:

• identify the minesite's existing and potential environmental management risks
• understand the different models of environmental management planning and review their relative advantages and disadvantages to the minesite, the work and available resources
• apply the principles of strategic environmental planning and review in maintaining minesite performance
• monitor and review the principles and methods underpinning the environmental evaluation of minesite performance
• understand the different models of minesite environmental performance evaluation and their relative advantages and disadvantages to the minesite, the work and available resources
• understand the use of both quantitative and qualitative methods to evaluate minesite environmental performance
• identify the types of information required to evaluate the minesite environmental performance and how to gather and validate such information
• develop appropriate measures and criteria to review minesite environmental performance
• apply externally imposed indicators which are relevant to measuring the minesite's environmental performance
• use the existing sources of data and means of data gathering available to them
• optimise these sources of data to review minesite environmental performance
• consult effectively with stakeholders on minesite environmental performance
• identify possible reasons for failure in minesite environmental performance
• analyse the reasons for success or failure in minesite environmental performance
• identify the lessons which may be drawn from past minesite environmental performance and their implications for future planning and continuous improvement activities
• present evaluation results effectively to a range of different audiences, both formally and informally.

KEY COMPETENCIES

<table>
<thead>
<tr>
<th>Key Competency</th>
<th>Level</th>
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<tr>
<td>Skill</td>
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<tr>
<td>Collecting, analysing &amp; organising info</td>
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<tr>
<td>Solving problems</td>
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<td>Using technology</td>
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**MNIL03A  Establish and manage the management information system**

**Description:** This unit covers the use of appropriate measures and criteria to establish, and manage the management information system.

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<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>L3.1 Identify and Source Information Needs.</td>
<td>L3.1.1 The information needs of individuals/teams is determined to ensure relevance and the sources identified.</td>
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<tr>
<td></td>
<td>L3.1.2 Information held by the organisation is reviewed to determine suitability and accessibility.</td>
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<td>L3.1.3 Plans are prepared to obtain information, which is not available/accessible within the organisation.</td>
</tr>
<tr>
<td>L3.2 Collect, Analyse and Report Information.</td>
<td>L3.2.1 Collection and distribution of information is timely and relevant to the needs of individuals/teams.</td>
</tr>
<tr>
<td></td>
<td>L3.2.2 Information is in a format suitable for analysis, interpretation and dissemination.</td>
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<tr>
<td></td>
<td>L3.2.3 Information is analysed to identify and report relevant trends and developments in terms of the needs for which it was acquired.</td>
</tr>
<tr>
<td>L3.3 Use Management Information Systems.</td>
<td>L3.3.1 Management information systems are used effectively to store and retrieve data for decision making and to ensure compliance with legislative requirements.</td>
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<tr>
<td></td>
<td>L3.3.2 Technology available in the work area/organisation is used to manage information efficiently and effectively.</td>
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<td>L3.3.3 Recommendations for improving the information system are submitted to designated persons/groups.</td>
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<td>L3.3.4 Integration of new and existing systems and processes is planned and prepared for to achieve optimum performance.</td>
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</tbody>
</table>
| | L3.3.5 A procedure to identify hazards and analyse and
evaluate risks associated with management information systems and equipment is established.

L3.4 Establish Systems for Audit and Review of Management Information Systems and Equipment.

L3.4.1 Procedures to evaluate and confirm system/equipment compliance with statutory and site requirements are established.

L3.4.2 Future management information system and equipment requirements are identified, assessed and incorporated into planning processes.

L3.4.3 Procedures to confirm the currency and compliance of management information systems are established.

L3.4.4 The system for recording and reporting of management information is established.

L3.4.5 Management information systems training activities are reviewed for currency and relevance.

L3.4.6 Procedures for incorporating feedback into the audit/review system are established.

L3.4.7 Procedures for response to instances of non-compliance or other discrepancies / deficiencies revealed by audit are established.

**DEFINITION OF TERMS**

For the purpose of this standard, the definitions below apply.

**audit**
a systematic examination against defined criteria to determine whether activities and related results conform to planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve the organisation's policy and objectives

**risk**
the combination of the frequency, or probability of occurrence, and consequence of a specified hazardous event

**RANGE OF VARIABLES**

A management information system includes the functions of design, development, establishment, installation, operations, protection, maintenance, monitoring and recording and reporting process.

Communication system may include, but not be limited to, oral, visual, phones, radios, electronic and telemetry.

Reporting and recording systems include site requirements and consist of phones, radios, computer systems, verbal and written.
Storage systems include hard copy files, electronic and computer files and libraries. Safety information and standards may be contained in legislation and regulations, relevant Australian standards, management plans, manager's rules, OH&S policy, codes of practice, manufacturers' instructions and standard working or job procedures (or equivalent) and industry guidelines.

Site documentation and training policy may include, but not be limited to, statutory and legislative requirements, management plans and procedures.

Specifications may include, but not be limited to, performance requirements, costs, dimensions, capacity, occupational health and safety requirements, training requirements, and key selection criteria.

Site policy, objectives, rules and procedures will vary from site to site.

**Statutory/legal compliance may include but is not limited to:**
- trade practices
- weights and measures
- waterways
- workers compensation/workcover
- planning and assessment
- local government
- dangerous goods
- minerals and extractive industry licensing
- industrial relations
- navigation
- mines act
- common law
- development of training policies/programmes to aid compliance.

**Actions are to be in accordance with all relevant statutory/legal requirements, particularly:**
- requirements for the maintenance of records for statutory/legal breaches
- provision of information and training
- regulations and codes of practice relating to statutory/legal compliance
- site representatives and committees
- issue resolution.

**Management operates within:**
- work schedules which may include shift work and varying hours of duty
- environments ranging from simple to complex and diverse
- appropriate policies, guidelines and processes
- a level of autonomy which may range from limited to substantial
- quality and continuous improvement processes and standards
- business and performance plans
- ethical standards established by the organisation
- productivity and profitability objectives and targets
- best practice and benchmarking principles and practices
- legislation, codes and practices
- resource parameters which may be defined or negotiated
- training and development principles and practices
- human resource policies and practices including interviewing, counselling, dispute settling and discipline
- financial accountability including profit and loss statements
- enterprise/industrial agreements/awards
- quality and continuous improvement processes and standards
- business and performance plans
- ethical standards established by the organisation
- productivity and profitability objectives and targets
- best practice and benchmarking principles and practices
- legislation, codes and practices
- resource parameters which may be defined or negotiated
- training and development principles and practices
- human resource policies and practices including interviewing, counselling, dispute settling and discipline
- financial accountability including profit and loss statements
- enterprise/industrial agreements/awards.

Management may assume varying roles including:
- leader
- coach
- facilitator
- mentor
- participant
- director
- trainer
- assessor.

Management will typically make decisions to:
- maintain statutory/legal compliance
- influence operational performance
- plan production schedules
- maximise production and minimise operating costs/risks and non-conformances
- analyse and review market/production predictions and costs
- manage projects and tasks.

Resources may include, but are not limited to:
- people
- finance
- equipment
- environment
- buildings/facilities
- technology
- information.

Negotiations may be with a variety of internal or external sources and be:
- formal or informal
- short-term or ongoing
- multi-lingual and cross-cultural
- enterprise agreements
- legislation regulation compliance
and include relative authorities, project managers, employees, contractors, customers and the community.

Consultation would typically include:
- regulatory authorities
- tenderers
- project managers
- contractors
- employees
- community
- customers
- suppliers.

EVIDENCE GUIDE

1. Context of Assessment

The ultimate competency outcome is for the candidate to be able to establish management information systems and, in so doing, to satisfy the performance criteria and underpinning knowledge requirements agreed by the industry in this Competency Unit.

Mine management information systems circumstances and requirements will differ markedly between mine sites. Therefore, there are limitations on the extent to which the practical establishment of the management information system may be assessed in the workplace. To bridge this potential gap and to ensure the candidate is able to apply the extensive theory to a working situation, assessment is likely to include formal simulation exercises.

The assessment system for this competency is to cover the following:

A. Theory and knowledge underpinning the competency which is a mandatory requirement

B. Application of theory to a generic practical situation/simulation which is a mandatory requirement

OR

C. Practical establishment of a management information system or equivalent activity.

In most cases it would be reasonable to infer competency if a candidate has completed assessments A and B in respect of each required competency and has satisfied assessment C in respect of this competency or has completed the conduct of a formal audit/review of an existing and significant mine management information system.

2. Inter-dependent Assessment of Units

Whilst there are some common features between the units at this level, commonality is generally limited to science and engineering theory and the planning process. This unit
requires the specialised application of knowledge. Generalised assessment is unlikely to satisfy the requirements of this unit or of the other allied units.

Unless inter-dependent assessment can be clearly demonstrated to satisfy the specialised requirements of each subject unit, and do so in a transparent and timely manner, the assessment should be on a unit by unit basis.

This unit covers four primary functions or outcomes being the identification and determining of information needs, the collection, analysis and reporting of information, the use of systems and the establishment of audit systems. It therefore represents an activity which may result in a range of other management and technical competencies being invoked.

3. **Critical Aspects of Evidence.** The Industry has established that, for portability purposes, it is essential that competence in this unit reflects successful assessment in the critical aspects of:

- interpreting and communicating information on mine management information systems
- assessing the mine management information systems requirements and external specifications
- evaluating and selecting mine information management systems and equipment
- defining roles and responsibilities for management of the mine information system
- establishing the operational and maintenance documentation for mine information systems and related equipment
- establishing and reviewing information system reporting procedures
- establishing and reviewing the training program
- reviewing and auditing the effectiveness of the management information system.

5. **Consistency of Performance.** Consistency of performance in this unit is aided by the standards of performance, which are contained within State Legislation and by professional standards and practices established and observed by the Industry. Mine information systems and their establishment are to meet Legislative and Industry standards.

**UNDERPINNING KNOWLEDGE**

6. A knowledge of the listed topics / disciplines in sufficient scope and depth to enable the candidate to establish, maintain, evaluate and improve the management information system.

A knowledge of:

- audit review process and techniques
- computer based systems
- contemporary information management technology and techniques
- legislative and site specific requirements for interpreting and communicating information on mine management information systems including, but not limited to, mine plans, environmental management, communication, emergency procedures, risk management, recording and reporting, mines rescue, OH&S, manufacturers'
instructions, standard work procedures, production, maintenance and other management information
- mine operating procedures
- safety design features of management information systems
- training programs

**UNDERPINNING SKILL**

6. The ability to:

- access, interpret and apply:
  - technical information
  - site/legislative requirements
  - records and reports
  - briefings and handover details
- assess the risks and consequences attached to management information systems and equipment
- plan and coordinate work
- identify training needs related to management information systems
- interpret and apply manufacturers' instructions.

**KEY COMPETENCIES**

<table>
<thead>
<tr>
<th>Key Competency</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
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<tr>
<td>Using mathematical ideas &amp; techniques</td>
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<td>Solving problems</td>
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<tr>
<td>Using technology</td>
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MNIL04A  
**Establish operational strategies**

Description: This unit covers the position the minesite occupies in relation to its stakeholders, both internal and external. Its application provides for the creation of operational strategies that are congruent with the minesite's business directions, policies and objectives and includes customer service and community profile issues.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>L4.1</td>
<td><strong>Develop Strategies which Add Value to the Minesite.</strong></td>
</tr>
<tr>
<td>L4.1.1</td>
<td>Strategic consultation with the stakeholders is conducted in a way that is open, realistic and likely to gain their support.</td>
</tr>
<tr>
<td>L4.1.2</td>
<td>The vision and mission take into account the requirements, expectations and interests of the minesite's governing body and appropriate stakeholders.</td>
</tr>
<tr>
<td>L4.1.3</td>
<td>The mission is both challenging and realistic and reflects the nature and values of the minesite and its role in the community.</td>
</tr>
<tr>
<td>L4.1.4</td>
<td>Values and policies are defined to take into account the requirements, expectations and interests of the minesite's governing body and appropriate stakeholders.</td>
</tr>
<tr>
<td>L4.1.5</td>
<td>Values and policies are clear and consistent with the minesite's vision and mission.</td>
</tr>
<tr>
<td>L4.1.6</td>
<td>The objectives and strategies take into account the requirements, expectations and interests of the minesite's governing body and appropriate stakeholders.</td>
</tr>
<tr>
<td>L4.1.7</td>
<td>The objectives and strategies are measurable, consistent with the minesite's mission and values, and are attainable within the agreed timescale and budget.</td>
</tr>
<tr>
<td>L4.1.8</td>
<td>The objectives and strategies take full account of the constraints and contain sufficient details to allow the planning and development of specific programmes of work.</td>
</tr>
<tr>
<td>L4.1.9</td>
<td>All strategies are regularly reviewed in the light of trends and opportunities.</td>
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<tr>
<td>L4.2</td>
<td><strong>Gain Customer and</strong></td>
</tr>
<tr>
<td>L4.2.1</td>
<td>Consultations and negotiations allow strategies to</td>
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</table>
Community Support for Minesite Strategies. be influenced by, and made more consistent with customer and community interests.

L4.2.2 Strategies are presented to customers and the community in a way that is likely to attract their support.

L4.2.3 Where customers and the community do not fully support strategies, action is taken to minimise potential problems.

L4.2.4 Customers and the community are consulted on a regular basis to ensure that support for the minesite's vision, mission, objectives and strategies is available when needed.

**DEFINITION OF TERMS**

For purposes of consistency, the following definitions have been applied in this standard.

- **consultation**
  - asking others for their views and involving them openly in decision making

- **mission**
  - the long-term goal the minesite seeks to achieve

- **minesite objectives**
  - clearly defined and measurable results which the minesite should achieve

- **policies**
  - rules which govern the way the minesite deals with key issues, for example health and safety, employment practices, customer relations, environment and community issues

- **stakeholders**
  - all those who have an interest in, or may be affected by the minesite and its activities; stakeholders may include, for example, shareholders, directors, politicians, employees, customers, supplier, local communities and many others

- **strategies**
  - long-term plans which will guide the minesite in achieving its mission

- **values**
  - those things the minesite believes in and seeks to realise in its work, for example, customer service, team working, quality or value for money

- **vision**
  - the model for the minesite in the future

**RANGE OF VARIABLES**
This competency standard is applicable for those with managerial responsibility.

It is to be exhibited in the work area of responsibility which would typically be a mine site. The competency involves relevant legislation and codes of practice, and the maintenance of records, provision of information and training and the dealing with committees, statutory/legal agencies and site personnel.

Processes for consultation may include committees, consultation with statutory/legal agencies/site representatives, issue resolution procedures and participative/consultative procedures conducted by supervisory staff within the area of managerial responsibility. Monitoring of activities may include review of written reports, performance appraisal or auditing procedures.

**Statutory/legal compliance may include but is not limited to:**
- industrial relations
- trade practices
- weights and measures
- waterways
- workers compensation/workcover
- planning and assessment
- local government
- industry licensing
- dangerous goods
- navigation
- mines act
- common law
- development of training policies/programmes to aid compliance.

**Actions are to be in accordance with all relevant statutory/legal requirements, particularly:**
- requirements for the maintenance of records for statutory/legal breaches
- provision of information and training
- regulations and codes of practice relating to statutory/legal compliance
- site representatives and committees
- issue resolution.

**Management operates within:**
- work schedules may include shift work and varying hours of duty
- environments ranging from simple to complex and diverse
- appropriate policies, guidelines and processes
- a level of autonomy which may range from limited to substantial
- quality and continuous improvement processes and standards
- business and performance plans
- ethical standards established by the organisation
- productivity and profitability objectives and targets
- best practice and benchmarking principles and practices
- legislation, codes and practices
- resource parameters which may be defined or negotiated
- training and development principles and practices
- human resource policies and practices including interviewing, counselling, dispute settling and discipline
financial accountability including profit and loss statements
enterprise/industrial agreements/awards.

Management may assume varying roles including:
- leader
- coach
- facilitator
- mentor
- participant
- director
- trainer
- assessor.

Management will typically make decisions to:
- maintain statutory/legal compliance
- influence operational performance
- plan production schedules
- maximise production and minimise operating costs/risks and non-conformances
- analyse and review market/production predictions and costs
- manage projects and tasks.

Resources may include, but are not limited to:
- people
- finance
- equipment
- environment
- buildings/facilities
- technology
- information.

Negotiations may be with a variety of internal or external sources and be:
- formal or informal
- short term or ongoing
- multi-lingual and cross-cultural
- enterprise agreements
- legislation regulation compliance and include relative authorities, project managers, employees, contractors, customers and the community.

Consultation would typically include:
- regulatory authorities
- tenderers
- project managers
- contractors
- employees
- community
- customers
- suppliers.
This guideline is to assist the development of assessment instruments/tools to assess the competence of mining managers. At this level, mining managers must provide evidence of consistent achievement of this Unit's workplace outcomes.

1. **Context of Assessment**

   Leadership and Management competency development in the Industry is to be designed to optimise aided learning of the essential underpinning knowledge and the mentored workplace development of application skills.

   The context of summative assessment should, to the maximum possible extent, be integrated with real work activities being completed by the candidate.

   The context of summative assessment should, to the maximum possible extent, be integrated with real work activities being completed by the candidate.

   Summative assessment of underpinning knowledge, to the extent it is required, and formative assessment of application skills may be conducted through simulations.

2. **Interdependent Assessment of Units**

   Within the Leadership and Management competency suite, there are a range of units which lend themselves to holistic assessment strategies.

   This unit covers two primary functions or outcomes being the development of strategies for the minesite's operation and the gaining of customer and community support for the minesite. It therefore represents activities which may result in a range of other management and technical competencies being invoked.

   For these reasons, it would be normal for the assessment of this unit to be handled as an individual entity.

3. **Critical Aspects of Evidence.** The Industry has established that, for portability purposes, it is essential that competency in this unit reflects successful assessment in the critical aspects of behaviours and outcomes which require the candidate to:

   - gain the support of stakeholders
   - determine and select evaluation measures and criteria for a significant mine function or activity
   - create a shared vision and mission
   - develop values, policies, objectives and strategies
   - consult and negotiate with customers and the community
   - review strategies.

4. **Consistency of Performance.** Consistency of performance in this unit is aided by the standards of performance within statutory and site rules, policies, procedures and regulations and by professional standards and practices established and observed by the Industry.
5. A knowledge of the listed topics/disciplines in sufficient scope and depth to enable the candidate to manage and enhance positive outcomes in the establishment of operational strategies.

- strategic planning
- statutory and site rules, policies, procedures and regulations
- critical path analysis and planning methods and techniques
- corporate planning model and techniques
- risk management processes and techniques
- industrial awards/enterprise agreements
- occupational health and safety
- advanced negotiation techniques
- organisational change and development
- assertive techniques
- action planning methods.

6. The ability to:

- display an understanding of how the different elements of the minesite and its environment fit together
- clearly relate management goals and actions to the strategic aims of the minesite
- identify the interests of stakeholders and their implications for the minesite and individuals
- clearly identify and address ethical concerns relevant to the minesite
- listen actively, ask questions, clarify points and rephrase others' statements to check mutual understanding
- present self positively to others
- understand and influence the culture of the minesite and act to work within it or it
- establish information networks to search for and gather relevant information
- make best use of existing sources of information
- identify patterns or meaning from events and data which are not obviously related
- produce a variety of solutions before taking decisions that are realistic for the situation.

<table>
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<tr>
<th>KEY COMPETENCIES</th>
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<tbody>
<tr>
<td>Key Competency</td>
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<td>Working with others in teams</td>
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Using mathematical ideas & techniques
Solving Problems
Using technology
## MNIL05A Manage the decision making process

**Description:** This unit covers the use of information for decision making within the minesite. Its application provides for obtaining and analysing information, making decisions and advising/informing the outcome to others.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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<tbody>
<tr>
<td>L5.1</td>
<td>Policies are developed which clearly express the minesite's commitment to decision making at the appropriate level.</td>
</tr>
<tr>
<td>L5.1.1</td>
<td>Responsibilities and duties which allow the implementation and integration of the decision making process are clearly defined and allocated.</td>
</tr>
<tr>
<td>L5.1.2</td>
<td>Systems and procedures are developed to provide the appropriate information to manage the decision making process.</td>
</tr>
<tr>
<td>L5.1.3</td>
<td>Information is provided to the level necessary for effective decision making.</td>
</tr>
<tr>
<td>L5.1.4</td>
<td>Decisions having impact beyond the decision maker's area of responsibility are to be notified to the area(s) concerned in a timely manner.</td>
</tr>
<tr>
<td>L5.2</td>
<td>Research the advice and information needs of recipients in ways which are appropriate and sufficient and take account of minesite constraints.</td>
</tr>
<tr>
<td>L5.2.1</td>
<td>Identify the information needed to make the required decisions at the various levels/sections of the minesite.</td>
</tr>
<tr>
<td>L5.2.2</td>
<td>Select information which is accurate, relevant to the objectives, and sufficient to arrive at reliable decisions.</td>
</tr>
<tr>
<td>L5.2.3</td>
<td>Methods of obtaining information are consistent with minesite values, policies and legal requirements.</td>
</tr>
<tr>
<td>L5.2.4</td>
<td>Where information is inadequate, contradictory or ambiguous, prompt and effective remedial action is taken.</td>
</tr>
<tr>
<td>L5.2.5</td>
<td>Methods of analysis are used which achieve the</td>
</tr>
</tbody>
</table>
objectives, identify patterns and trends, and lead to clear conclusions.

L5.2.7 A record of the analysis is sufficient to indicate assumptions and decisions made at each stage.

L5.3 Make Decisions.

L5.3.1 Decisions are based on sufficient, valid and reliable information and analysis.

L5.3.2 Decisions are consistent with minesite values, policies, guidelines and procedures.

L5.3.3 Decisions are made in time for appropriate action to be taken.

L5.4 Advise and Inform Others.

L5.4.1 Decisions are timely and communicated clearly to those who need to know.

L5.4.2 Advice and information are provided at a time and place and in a form and manner appropriate to the needs of recipients.

L5.4.3 The information provided is accurate, current, relevant and sufficient.

L5.4.4 Advice is consistent with minesite policy, procedures, and constraints and supported by reasoned arguments and appropriate evidence.

L5.4.5 Recipients' understanding of the advice and information provided is confirmed.

L5.4.6 Feedback from recipients is used to improve the way advice and information is provided.

L5.4.7 Feedback processes are used effectively to monitor the implementation and impact of decisions.

DEFINITION OF TERMS

For purposes of consistency, the following definitions have been applied in this standard.

analysis the process of organising and interpreting information so that conclusions can be drawn; methods may be formal and planned, or informal and ad hoc

decisions Reaching conclusions on action to be taken both in terms of
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>legal requirements</td>
<td>laws relevant to the collection, recording, storage and distribution of information</td>
</tr>
<tr>
<td>minesite constraints</td>
<td>the minesite's policies, objectives and level of resources which limit the ability to collect, store and distribute information</td>
</tr>
<tr>
<td>policies</td>
<td>rules which govern the way the minesite deals with key issues</td>
</tr>
<tr>
<td>recipients</td>
<td>those people receiving information and advice</td>
</tr>
<tr>
<td>systems and procedures</td>
<td>Methods of recording and filing information for future use</td>
</tr>
<tr>
<td>values</td>
<td>those things the minesite believes in and seeks to realise in its work</td>
</tr>
</tbody>
</table>

**RANGE OF VARIABLES**

This competency standard is applicable for those with managerial responsibility.

It is to be exhibited in the work area of responsibility which would typically be a mine site. The competency involves relevant legislation and codes of practice, and the maintenance of records, provision of information and training and the dealing with committees, statutory/legal agencies and site personnel. Processes for consultation may include committees, consultation with statutory/legal agencies/site representatives, issue resolution procedures and participative/consultative procedures conducted by supervisory staff within the area of managerial responsibility. Monitoring of activities may include review of written reports, performance appraisal or auditing procedures.

**Statutory/legal compliance may include but is not limited to:**

- trade practices
- weights and measures
- waterways
- workers compensation/workcover
- planning and assessment
- local government
- dangerous goods
- industry licensing
- industrial relations
- navigation
- mines act
- common law
- development of training policies/programmes to aid compliance.

**Actions are to be in accordance with all relevant statutory/legal requirements, particularly:**
requirements for the maintenance of records for statutory/legal breaches
provision of information and training
regulations and codes of practice relating to statutory/legal compliance
site representatives and committees
issue resolution.

Management operates within:
work schedules may include shift work and varying hours of duty
environments ranging from simple to complex and diverse
appropriate policies, guidelines and processes
a level of autonomy which may range from limited to substantial
quality and continuous improvement processes and standards
business and performance plans
ethical standards established by the organisation
productivity and profitability objectives and targets
best practice and benchmarking principles and practices
legislation, codes and practices
resource parameters which may be defined or negotiated
training and development principles and practices
human resource policies and practices including interviewing, counselling, dispute settling and discipline
financial accountability including profit and loss statements
enterprise/industrial agreements/awards.

Management may assume varying roles including:
leader
coach
facilitator
mentor
participant
director
trainer
assessor.

Management will typically make decisions to:
maintain statutory/legal compliance
influence operational performance
plan production schedules
maximise production and minimise operating costs/risks and non-conformances
analyse and review market/production predictions and costs
manage projects and tasks.

Resources may include, but are not limited to:
people
finance
equipment
environment
buildings/facilities
Negotiations may be with a variety of internal or external sources and be:

- formal or informal
- short term or ongoing
- multi-lingual and cross-cultural
- enterprise agreements
- legislation regulation compliance and include relative authorities, project managers, employees, contractors, customers and the community.

Consultation would typically include:

- regulatory authorities
- tenderers
- project managers
- contractors
- employees
- community
- suppliers.

**EVIDENCE GUIDE**

This guideline is to assist the development of assessment instruments/tools to assess the competence of mining managers. At this level, mining managers must provide evidence of consistent achievement of this Unit's workplace outcomes.

1. **Context of Assessment**

   Leadership and Management competency development in the Industry is to be designed to optimise aided learning of the essential underpinning knowledge and mentored workplace development of application skills.

   The context of summative assessment should, to the maximum possible extent, be integrated with real work activities being completed by the candidate.

   Summative assessment of underpinning knowledge, to the extent it is required, and formative assessment of application skills may be conducted through simulations.

2. **Interdependent Assessment of Units**

   Within the Leadership and Management competency suite, there are a range of units which lend themselves to holistic assessment strategies.

   This unit covers four primary functions or outcomes being the development of the decision making processes, gaining and analysing information, making decisions and promulgation of decisions. It therefore represents a process which may result in a range of other management and technical competencies being invoked.
For these reasons, it would be normal for the assessment of this unit to be handled as an individual entity.

3. **Critical Aspects of Evidence.** The Industry has established that, for portability purposes, it is essential that competency in this unit reflects successful assessment in the critical aspects of behaviours and outcomes which require the candidate to:

- identify the level and the process of decision making
- provide information systems to manage the process
- identify and analyse the information
- make decisions
- promulgate decisions.

4. **Consistency of Performance.** Consistency of performance in this unit is aided by the standards of performance which are contained within State Legislation and by professional standards and practices established and observed by the Industry.

**UNDERPINNING KNOWLEDGE**

5. A knowledge of the listed topics/disciplines in sufficient scope and depth to enable the candidate to obtain and analyse information, make decisions and advise/inform the outcomes to others.

**A knowledge of:**

- strategic planning
- industrial awards/enterprise agreements
- occupational health and safety
- advanced negotiation techniques
- organisational change and development
- corporate, group and individual goal setting techniques
- corporate planning model and techniques
- critical path analysis and planning methods and techniques
- statutory and site rules, policies, procedures and regulations
- assertive techniques
- risk management processes and techniques
- action planning methods
- information technology.

**UNDERPINNING SKILLS**

6. **The ability to:**

- clearly relate your goals and actions to the strategic aims of the minesite
- identify and interpret reports and information
- take opportunities when they arise to achieve the longer-term aims or needs of your minesite
- listen actively, ask questions, clarify points and rephrase others’ statements to check mutual understanding
• adopt communication styles appropriate to listeners and situations, including selecting an appropriate time and place
• encourage listeners to ask questions or rephrase statements to clarify their understanding
• present yourself positively to others
• create and prepare strategies for influencing others
• use a variety of means to influence others
• understand the culture of the minesite and act to work within it or influence it
• establish information networks to search for and gather relevant information
• make best use of existing sources of information
• seek information from multiple sources
• challenge the validity and reliability of sources of information
• push for concrete information in an ambiguous situation
• break processes down into tasks and activities
• identify implications, consequences or causal relationships in a situation

• identify patterns or meaning from events and data which are not obviously related
• build a total and valid picture from restricted or incomplete data
• produce a variety of solutions before taking a decision
• balance intuition with logic in decision making
• reconcile and make use of a variety of perspectives when making sense of a situation
• produce own ideas from experience and practice
• take decisions which are realistic for the situation
• take decisions in uncertain situations or based on restricted information when necessary.

**KEY COMPETENCIES**

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</table>
**MNIL06A  Provide leadership**

**Description:** This unit covers the provision of leadership to subordinates and involves shaping and managing organisational culture. Its application requires the provision of resources, objectives, support and advice together with the delegation of responsibility and authority for the empowerment of others.

(This unit extends on from BSXFMI502A).

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<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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<tbody>
<tr>
<td></td>
<td>L6.1.1 Individual performance meets the organisation's requirements.</td>
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<td></td>
<td>L6.1.2 Individual performance serves as a positive role model for others.</td>
</tr>
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<td></td>
<td>L6.1.3 Performance plans are developed and implemented in accordance with the organisation's goals and objectives.</td>
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<td></td>
<td>L6.1.4 Key Performance Indicators are negotiated and developed within the team's/organisation's business and/or strategic plans.</td>
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<td></td>
<td>L6.1.5 The organisation's standards and values are interpreted and applied in defining objectives and conducting business.</td>
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<td></td>
<td>L6.1.6 Standards and values considered to be damaging to the organisation are questioned through established communication channels.</td>
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<tr>
<td></td>
<td>L6.1.7 Personal performance contributes to developing an organisational culture which has integrity and credibility.</td>
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<tr>
<td>L6.2</td>
<td>Influence Individuals and Teams Positively.</td>
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<tr>
<td></td>
<td>L6.2.1 Expectations, roles and responsibilities are communicated in a way which encourages individuals/teams to take responsibility for their work performance.</td>
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<tr>
<td></td>
<td>L6.2.2 Identify personal and organisational work areas which may be delegated additional responsibility and authority.</td>
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<td></td>
<td>L6.2.3 Delegation of responsibility and authority is clear, explicit and allows sufficient time for the work to be carried out.</td>
</tr>
</tbody>
</table>
|         | L6.2.4 Provide sufficient resources and support for the delegated work to take place in required
timescale.

L6.2.5 Review delegated responsibility and authority at appropriate intervals and revise the arrangements as necessary.

L6.2.6 Individual's/team's efforts and contributions are encouraged, valued and rewarded.

L6.3 Provide Advice and Support.

L6.3.1 Advice and support is provided when requested or when identified by a review.

L6.3.2 Provide advice and support as is necessary to allow progress to be maintained and to enable people to work autonomously.

L6.3.3 Performance is monitored to determine the type and extent of additional work-based support.

L6.3.4 Feedback from individuals/teams is used to identify and introduce improvements.

L6.3.5 Records and reports are documented and maintained within the organisation's systems and procedures.

L6.4 Make Informed Decisions.

L6.4.1 Information relevant to the issues under consideration is gathered and organised.

L6.4.2 Individuals/teams are consulted, opinions listened to, options examined and their risks assessed to determine preferred courses of action.

L6.4.3 Decisions are timely and communicated clearly to individuals/teams.

L6.4.4 Feedback processes are used effectively to monitor the implementation and impact of decisions.

**DEFINITION OF TERMS**

For purposes of consistency, the following definitions have been applied in this standard.

**advice and support** providing direct advice, referring people to other sources of knowledge and expertise, giving hands-on assistance and providing suitable development activities

**authority** the power to achieve delegated objectives within an agreed
framework

delegation
giving someone else authority and responsibility to meet an objective or carry out a task

objectives
clearly defined and measurable results which your minesite or programme of work is scheduled to achieve

responsibility
being accountable for the achievement of objectives

targets
results to be achieved by a programme of work; these results may be in terms of product or service outcomes, expenditure and revenue, or overall benefits to the minesite

RANGE OF VARIABLES

This competency standard is applicable for those with managerial responsibility.

It is to be exhibited in the work area of responsibility which would typically be a mine site. The competency involves relevant legislation and codes of practice, and the maintenance of records, provision of information and training and the dealing with committees, statutory/legal agencies and site personnel.

Processes for consultation may include committees, consultation with statutory/legal agencies/site representatives, issue resolution procedures and participative/consultative procedures conducted by supervisory staff within the area of managerial responsibility.

Monitoring of activities may include review of written reports, performance appraisal or auditing procedures.

Statutory/legal compliance may include but is not limited to:
• trade practices
• weights and measures
• waterways
• workers compensation/workcover
• planning and assessment
• local government
• dangerous goods
• industry licensing
• industrial relations
• navigation
• mines act
• common law
• development of training policies/programmes to aid compliance.

Actions are to be in accordance with all relevant statutory/legal requirements, particularly:
• requirements for the maintenance of records for statutory/legal breaches
• provision of information and training
• regulations and codes of practice relating to statutory/legal compliance
• site representatives and committees
• issue resolution.

Management operates within:
• work schedules may include shift work and varying hours of duty
• environments ranging from simple to complex and diverse
• appropriate policies, guidelines and processes
• a level of autonomy which may range from limited to substantial
• quality and continuous improvement processes and standards
• business and performance plans
• ethical standards established by the organisation
• productivity and profitability objectives and targets
• best practice and benchmarking principles and practices
• legislation, codes and practices
• resource parameters which may be defined or negotiated
• training and development principles and practices
• human resource policies and practices including interviewing, counselling, dispute settling and discipline
• financial accountability including profit and loss statements
• enterprise/industrial agreements/awards.

Management may assume varying roles including:
• leader
• coach
• facilitator
• mentor
• participant
• director
• trainer
• assessor.

Management will typically make decisions to:
• maintain statutory/legal compliance
• influence operational performance
• plan production schedules
• maximise production and minimise operating costs/risks and non-conformances
• analyse and review market/production predictions and costs
• manage projects and tasks.

Resources may include, but are not limited to:
• people
• finance
• equipment
• environment
• buildings/facilities
• technology
• information.
Negotiations may be with a variety of internal or external sources and be:

- formal or informal
- short term or ongoing
- multi-lingual and cross-cultural
- enterprise agreements
- legislation regulation compliance and include relative authorities, project managers, employees, contractors, customers and the community.

Consultation would typically include:

- regulatory authorities
- tenderers
- project managers
- contractors
- employees
- community
- customers
- suppliers.

**EVIDENCE GUIDE**

This guideline is to assist the development of assessment instruments/tools to assess the competence of mining managers. At this level, mining managers must provide evidence of consistent achievement of this Unit's workplace outcomes.

1. **Context of Assessment**

   Leadership and Management competency development in the Industry is to be designed to optimise aided learning of the essential underpinning knowledge and mentored workplace development of application skills.

   The context of summative assessment should, to the maximum possible extent, be integrated with real work activities being completed by the candidate.

   Summative assessment of underpinning knowledge, to the extent it is required, and formative assessment of application skills may be conducted through simulations.

2. **Interdependent Assessment of Units**

   Within the Leadership and Management competency suite, there are a range of units which lend themselves to holistic assessment strategies.

   This unit covers four primary functions or outcomes being the delegation of responsibility and authority, the agreement of targets, the provision of advice and support to delegates and the monitoring and recording of progress. It therefore represents activities which may result in a range of other management and technical competencies being invoked.

   For these reasons, it would be normal for the assessment of this unit to be handled as an individual entity.
3. **Critical Aspects of Evidence.** The Industry has established that, for portability purposes, it is essential that competency in this unit reflects successful assessment in the critical aspects of behaviours and outcomes which require the candidate to:

- delegate responsibility and authority to others
- identify the necessary knowledge and skills of delegates
- provide resources to delegates
- agree work targets and key performance indicators with delegates
- review targets and resources
- provide advice and support to delegates
- monitor and record performance.

4. **Consistency of Performance.** Consistency of performance in this unit is aided by the standards of performance which are contained within State legislation and by professional standards and practices established and observed by the Industry.

**UNDERPINNING KNOWLEDGE**

5. A knowledge of the listed topics/disciplines in sufficient scope and depth to enable the candidate to identify and apply positive and effective leadership for the organisation.

A knowledge of:

- strategic planning
- industrial awards/enterprise agreements
- human resource management
- leadership models
- leadership practice (case studies)
- leadership theory
- occupational health and safety
- advanced negotiation techniques
- organisational change and development
- statutory and site rules, policies, procedures and regulations
- assertive techniques
- risk management processes and techniques
- action planning methods.

**UNDERPINNING SKILLS**

6. The ability to:

- take a leading role in initiating actions and making decisions
- clearly identify what is required of others
- manage work effectively to achieve goals and results
- monitor and introduce ways for people to develop knowledge and skills
- encourage colleagues to share their knowledge and skills
- use coaching and mentoring to assist knowledge and skill formation
- promote a learning culture in a diverse and complex workplace
• create opportunities for individuals/teams to learn from workplace performance
• encourage ideas and feedback
• maintain a focus on objectives
• take personal responsibility for making things happen
• take control of situations and events
• act in an assured and unhesitating manner when faced with a challenge
• make time available to support others
• encourage and stimulate others to make the best use of their abilities
• show respect for the views and actions of others
• show sensitivity to the needs and feelings of others
• use power and authority in a fair and equitable manner
• keep others informed about plans and progress
• invite others to contribute to planning and organising work
• set objectives which are both achievable and challenging
• check individuals' commitment to a specific course of action
• use a variety of techniques to promote morale and productivity
• identify and resolve causes of conflict or resistance
• prioritise objectives and schedule work to make best use of time and resources
• set objectives in uncertain and complex situations
• establish and communicate high expectations of performance, including setting an example to others
• continually strive to identify and minimise barriers to excellence.

**KEY COMPETENCIES**

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<th>Level 3</th>
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MNIL07A Manage organisational change

Description: This unit covers the use and application of the skills necessary to identify the imperatives for change. Its application involves the planning, implementation, management and evaluation of an effective change process.

(This unit extends on from BSXFMI510A).

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<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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<tbody>
<tr>
<td>L7.1</td>
<td>Interpret Strategic Goals and Objectives.</td>
</tr>
<tr>
<td>L7.1.1</td>
<td>The organisation's strategic goals and objectives are reviewed, clarified and confirmed.</td>
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<tr>
<td>L7.1.2</td>
<td>Strategic plans are interpreted to identify risks and implications for change within the mine site.</td>
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<tr>
<td>L7.1.3</td>
<td>Strategic plans are interpreted to determine operational implications from proposed changes for the minesite.</td>
</tr>
<tr>
<td>L7.1.4</td>
<td>Core skills and resources are determined and confirmed.</td>
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<tr>
<td>L7.1.5</td>
<td>The strategic role of the minesite's operations within the total business system is communicated to relevant personnel.</td>
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<tr>
<td>L7.2</td>
<td>Plan for the Introduction of Change.</td>
</tr>
<tr>
<td>L7.2.1</td>
<td>The concepts and principles to manage the minesite's skills and resources during the implementation of change are understood.</td>
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<tr>
<td>L7.2.2</td>
<td>The implications for the minesite of implementing the proposed changes is clearly identified for the following areas;</td>
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<td></td>
<td>− resource allocation</td>
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<td>− operations</td>
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<td>− human resources</td>
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<td>− marketing.</td>
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<tr>
<td>L7.2.3</td>
<td>The organisation's objectives and plans to introduce change are explained clearly to individuals/teams.</td>
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<tr>
<td>L7.3</td>
<td>Manage the Minesite's Culture while Implementing Change.</td>
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<tr>
<td>L7.3.1</td>
<td>The issues influencing the culture of the minesite are identified.</td>
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<tr>
<td>L7.3.2</td>
<td>The extent of cultural change necessary to implement the proposed change(s) is assessed.</td>
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</table>
L7.3.3 A range of indicators are selected to evaluate the mine site's culture during the implementation of the new changes.

L7.3.4 Plans are developed to facilitate the development of the desired culture.

L7.3.5 The indicators of the mine site's culture are monitored.

L7.4 Monitor, Adjust and Review Strategies for Change.

L7.4.1 Leadership characteristics for the management of strategies for change are demonstrated.

L7.4.2 Coaching and mentoring is carried out for individuals/teams to assist them in handling change efficiently and effectively.

L7.4.3 Individuals/teams respond effectively and efficiently to changes in the mine site's goals, plans and priorities.

L7.4.4 Timely adjustments are made to strategic plans to respond to the changing needs of customers and the mine site.

L7.4.5 Individuals/teams are kept informed of progress in the implementation of change.

L7.4.6 Timely adjustments are made to strategic plans to respond to the changing needs of customers and the mine site.

L7.4.7 Strategic plans are reviewed for effectiveness.

L7.4.8 Recommendations for improving the methods and/or techniques to manage change are recorded in accordance with enterprise procedures.

DEFINITION OF TERMS

For purposes of consistency, the following definitions have been applied in this standard.

objectives clearly defined and measurable results which your mine site or program of work is scheduled to achieve

strategic plans plans which will guide your mine site in achieving its objectives

change to stop or start doing something or to do something you do now, differently
**minesite culture**
the framework of shared meanings amongst people, its values, symbols, rituals and practices that have evolved over time

**advice and support**
providing direct advice, referring people to other sources of knowledge and expertise, giving hands-on assistance and providing suitable development activities

**responsibility**
being accountable for the achievement of objectives

**customers**
someone who purchases/buys/utilises goods and/or services from another

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**RANGE OF VARIABLES**

This unit describes generic customer service competencies applicable for those with managerial responsibilities.

It is to be exhibited in the work area of responsibility which would typically be a mine site.

The competency involves application of relevant customer service standards and codes of practice and provision of information and training.

Processes for consultation may include customer service review committees, consultation with customer service representatives, issue resolution procedures and participative/consultative procedures conducted by supervisory staff within the area of managerial responsibility.

Monitoring of activities may include review of written reports, performance appraisal or auditing procedures.

Relevant positions for implementing the customer service delivery system will include managers, supervisors and employees.

**Management operates within:**

- work schedules may include shift work and varying hours of duty
- environments ranging from simple to complex and diverse
- appropriate policies, guidelines and processes
- a level of autonomy which may range from limited to substantial.

**All actions are to be in accordance with all relevant statutory/legal requirements, particularly:**

- requirements for the maintenance of records for statutory/legal breaches
- provision of information and training
- regulations and codes of practice relating to statutory/legal compliance
- site representatives and committees
- issue resolution.

**Statutory/legal compliance may include but is not limited to:**

- trade practices
weights and measures
• waterways
• workers compensation/workcover
• planning and assessment
• local government
• dangerous goods
• industry licensing
• industrial relations
• navigation
• mines act
• common law
• development of training policies/programmes to aid compliance

Criteria which may require consideration include:
• business and performance plans
• ethical standards established by the organisation
• productivity and profitability objectives and targets
• best practice and benchmarking principles and practices
• legislation, codes and practices
• resource parameters which may be defined or negotiated
• training and development principles and practices
• human resource policies and practices including interviewing, counselling, dispute settling and discipline
• financial accountability including profit and loss statements
• enterprise/industrial agreements/awards.

Management may assume varying roles including:
• leader
• coach
• facilitator
• mentor
• participant
• director
• trainer
• assessor.

Management will typically make decisions to:
• maintain statutory/legal compliance
• influence operational performance
• plan production schedules
• maximise production and minimise operating costs/risks and non-conformances
• analyse and review market/production predictions and costs
• manage projects and tasks.

Negotiations may be with a variety of internal or external sources and be:
• formal or informal
• short term or ongoing
• multi-lingual and cross-cultural
enterprise agreements
legislation regulation compliance and include relative authorities, project managers, employees, contractors, customers and the community.

Consultation would typically include:
regulatory authorities
tenderers
project managers
contractors
employees
community
customers
suppliers.

EVIDENCE GUIDE
This guideline is to assist the development of assessment instruments/tools to assess the competence of mining managers. At this level, mining managers must provide evidence of consistent achievement of this Unit's workplace outcomes.

1. Context of Assessment

Leadership and Management competency development in the Industry is to be designed to optimise aided learning of the essential underpinning knowledge and mentored workplace development of application skills.

The context of summative assessment should, to the maximum possible extent, be integrated with real work activities being completed by the candidate.

Summative assessment of underpinning knowledge, to the extent it is required, and formative assessment of application skills may be conducted through simulations.

2. Interdependent Assessment of Units

Within the Leadership and Management competency suite, there are a range of units which lend themselves to holistic assessment strategies.

This unit covers six primary functions or outcomes being the interpretation of strategic goals and objectives, planning for the introduction of change, managing the minesite's culture and monitoring, adjusting and reviewing strategies. It therefore represents activities which may result in a range of other management and technical competencies being invoked.

For these reasons, it would be normal for the assessment of this unit to be handled as an individual entity.

3. Critical Aspects of Evidence. The Industry has established that, for portability purposes, it is essential that competency in this unit reflects successful assessment in the critical aspects of behaviours and outcomes which require the candidate to:
• gain the support of stakeholders
• develop effective policies, objectives and strategies
• review and improve strategies
• develop and maintain effective communication with customers
• make decisions within responsibility and authority in a diverse and complex workplace
• research, acquire and use information appropriate to work responsibility
• use effective consultative processes
• treat people openly and fairly
• use information management systems
• select and use available technology appropriate to the task
• manage work effectively to achieve goals and results.

4. **Consistency of Performance.** Consistency of performance in this unit is aided by the standards of performance which are contained within State Legislation and by professional standards and practices established and observed by the Industry.

**UNDERPINNING KNOWLEDGE**

5. A knowledge of the listed topics/disciplines in sufficient scope and depth to enable the candidate to research, plan, resource and facilitate organisational change processes.

**A knowledge of:**
• strategic planning
• statutory and site rules, policies, procedures and regulations
• critical path analysis and planning methods and techniques
• corporate planning model and techniques
• risk management processes and techniques
• industrial awards/enterprise agreements
• occupational health and safety
• advanced negotiation techniques
• organisational change and development
• assertive techniques
• action planning methods
• duty of care
• human resource management.

**UNDERPINNING SKILLS**

6. **The ability to:**
• display an understanding of how the different parts of the minesite and its environment fit together
• work towards a clearly defined vision of the future
• clearly relate your goals and actions to the strategic aims of the minesite
• take opportunities when they arise to achieve the longer-term aims or needs of your minesite
• set objectives and create cultures which are ethical
• identify the interests of stakeholders and their implications for the minesite and individuals
• clearly identify and raise ethical concerns relevant to the minesite
• work towards the resolution of ethical dilemmas based on reasoned approaches
• understand and resist apparent pressures from organisational systems to achieve results by any means
• communicate a vision which generates excitement, enthusiasm and commitment
• listen actively, ask questions, clarify points and rephrase others’ statements to check mutual understanding
• adopt communication styles appropriate to listeners and situations, including selecting an appropriate time and place
• present yourself positively to others
• create and prepare strategies for influencing others
• understand the culture of the minesite and act to work within it or influence it
• establish information networks to search for and gather relevant information

• make best use of existing sources of information
• seek information from multiple sources
• break processes down into tasks and activities
• identify patterns or meaning from events and data which are not obviously related
• produce a variety of solutions before taking a decision
• take decisions which are realistic for the situation.

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**MNIL08A Manage group process**

Description: This unit covers the use of appropriate skills and approaches to effectively manage human resources. Its application involves influencing groups and individuals to work cohesively and effectively towards the achievement of site performance requirements.

(This unit extends on from aspects of BSXFMI503 and BSXFMI504A).

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<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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<tbody>
<tr>
<td>L8.1 Working Relationship Frameworks and Processes are Developed.</td>
<td>L8.1.1 The organisational and minesite culture and work environment is analysed and an appropriate management style developed.</td>
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<td></td>
<td>L8.1.2 Consultation about proposed activities is conducted at appropriate times and in a manner which encourages open, frank discussion.</td>
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<td>L8.1.3 The benefits that can be achieved from the diversity of individuals to enhance workplace harmony are identified and analysed.</td>
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<td></td>
<td>L8.1.4 Processes designed to ensure employee participation in decision making is established.</td>
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<td></td>
<td>L8.1.5 Timely information about organisational plans and activities, emerging threats and opportunities are provided at a level and a pace appropriate to the individuals concerned.</td>
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<td></td>
<td>L8.1.6 Processes and ground rules are developed to ensure that people at the minesite are treated with respect.</td>
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<td></td>
<td>L8.1.7 Commitments and undertakings entered into with employees are honoured.</td>
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<td></td>
<td>L8.1.8 Employees are provided with sufficient support to achieve work objectives.</td>
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<td></td>
<td>L8.1.9 Evaluation of work and workplace behaviour is discussed directly with the individual concerned and the confidentiality of the feedback given is maintained.</td>
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<tr>
<td></td>
<td>L8.1.10 Reports on activities, progress, results and achievements are provided in a timely and accurate manner.</td>
</tr>
</tbody>
</table>
L8.1.11 Proposals for action are clear and realistic.

L8.1.12 Constructive efforts to resolve disagreements and maintain good working relationships are taken to ensure work objectives are met and workplace harmony maintained.

L8.2 Work Plans are Negotiated with Teams and Individuals to Achieve Objectives.

L8.2.1 Work targets are planned from organisational and minesite goals.

L8.2.2 Work methods are planned to maximise the use of available resources.

L8.2.3 The degree of direction required by individuals is assessed and used to best effect in overall work planning.

L8.2.4 Realistic work targets are agreed with individuals and teams to optimise the use of resources and existing competencies of personnel.

L8.2.5 Work targets and methods are designed to ensure that the minesite's objectives are achieved.

L8.2.6 Team and individual responsibilities and limits of authority are clearly defined and recorded where necessary.

L8.2.7 Where possible, allocated work activities provide individuals with suitable learning opportunities.

L8.3 Inter-Group and Intra-Group Processes are Managed.

L8.3.1 Work values and clear and relevant guidance indicating the limits of acceptable practice are promoted.

L8.3.2 Potential and actual conflicts between personnel are identified promptly and actions taken to deal with them as soon as is practicable.

L8.3.3 Problems and conflicts are adequately resourced to achieve timely resolution.

L8.3.4 Differences of opinion are handled in ways that minimise offence and conflict to ensure respect is maintained.

L8.3.5 Disciplinary sanctions are applied where necessary in accordance with minesite policies and legal requirements.
For purposes of consistency, the following definitions have been applied in this standard.

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
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<tbody>
<tr>
<td>confidentiality</td>
<td>only providing information to those who are authorised to have it</td>
</tr>
<tr>
<td>consultation</td>
<td>asking others for their views and involving them openly in decision-making</td>
</tr>
<tr>
<td>disciplinary sanctions</td>
<td>action, such as warnings or dismissal, taken against an employee for actions contrary to minesite values, policies and procedures</td>
</tr>
<tr>
<td>employee participation</td>
<td>activities which involve employees in contributing to the effective working relationships at the minesite</td>
</tr>
<tr>
<td>evaluation</td>
<td>a balanced assessment of people's work and behaviour</td>
</tr>
<tr>
<td>individuals</td>
<td>colleagues or team members with whom you work</td>
</tr>
<tr>
<td>opportunities</td>
<td>developments, either inside or outside the minesite, which could have a positive impact on work or plans if appropriate action is taken</td>
</tr>
<tr>
<td>minesite policies</td>
<td>the policies of the minesite relevant to work activities</td>
</tr>
<tr>
<td>respect for individuals</td>
<td>the open acknowledgment that individuals have the right to their own views, actions and development as long as these do not unduly constrain the rights of others</td>
</tr>
<tr>
<td>support</td>
<td>the verbal or actual support (such as giving time, resources or advice) which is provided</td>
</tr>
<tr>
<td>threats</td>
<td>developments, either inside or outside the minesite, which have the potential to have a negative impact on work or plans if appropriate action is not taken</td>
</tr>
<tr>
<td>trust</td>
<td>the feeling held by others that they can believe what is said, that action is consistent, that promises are kept and commitments are honoured</td>
</tr>
<tr>
<td>values</td>
<td>the principles which the minesite believes in and seeks to realise in its work; the values of the minesite may be reflected in its mission, standards of work, relationships between individuals at work, relationships with suppliers, customers and other stakeholders, personnel management and reward systems, training, equal opportunities, health and safety and environmental policies</td>
</tr>
</tbody>
</table>

**RANGE OF VARIABLES**

This competency standard is applicable for those with managerial responsibility.
It is to be exhibited in the work area of responsibility which would typically be a mine site. This competency involves relevant legislation and codes of practice, and the maintenance of records, provision of information and training and the dealing with committees, statutory/legal agencies and site personnel.

Processes for consultation may include committees, consultation with statutory/legal agencies/site representatives, issue resolution procedures and participative/consultative procedures conducted by supervisory staff within the area of managerial responsibility.

Monitoring of activities may include review of written reports, performance appraisal or auditing procedures.

**Statutory/legal compliance may include but is not limited to:**
- common law
- dangerous goods
- development of training policies/programmes
- industrial relations
- industry licensing
- local government
- mines act
- navigation
- planning and assessment
- trade practices
- waterways
- weights and measures
- workers compensation/workcover.

**All actions are to be in accordance with all relevant statutory/legal requirements, particularly:**
- issue resolution
- site representatives and committees
- provision of information and training
- requirements for the maintenance of records for statutory/legal breaches
- regulations and codes of practice relating to statutory/legal compliance.

**Management operates within:**
- human resource policies and practices including interviewing, counselling, dispute settling and discipline
- enterprise/industrial agreements/awards
- training and development principles and practices
- work schedules may include shift work and varying hours of duty
- environments ranging from simple to complex and diverse
- productivity and profitability objectives and targets
- appropriate policies, guidelines and processes
- a level of autonomy which may range from limited to substantial
- legislation, codes and practices
- resource parameters which may be defined or negotiated
- quality and continuous improvement processes and standards
- business and performance plans
• ethical standards established by the organisation
• best practice and benchmarking principles and practices
• financial accountability including profit and loss statements.

Management may assume varying roles including:
• leader
• coach
• facilitator
• mentor
• participant
• director
• trainer
• assessor.

Management will typically make decisions to:
• influence operational performance
• maintain statutory/legal compliance
• plan production schedules
• maximise production and minimise operating costs/risks and non-conformances
• analyse and review market/production predictions and costs
• manage projects and tasks.

Resources may include, but are not limited to:
• people
• finance
• equipment
• environment
• buildings/facilities
• technology
• information.

Negotiations may be with a variety of internal or external sources and be:
• formal or informal
• short term or ongoing
• multi-lingual and cross-cultural
• enterprise agreements
• legislation regulation compliance and include relative authorities, project managers, employees, contractors, customers and the community.

Consultation would typically include:
• employees
• regulatory authorities
• tenderers
• project managers
• contractors
• community
• customers
• suppliers.
**EVIDENCE GUIDE**

This guideline is to assist the development of assessment instruments/tools to assess the competence of mining managers. At this level, mining managers must provide evidence of consistent achievement of this Unit's workplace outcomes.

1. **Context of Assessment**

   Leadership and Management competency development in the Industry is to be designed to optimise aided learning of the essential underpinning knowledge and mentored workplace development of application skills.

   The context of summative assessment should, to the maximum possible extent, be integrated with real work activities being completed by the candidate.

   Summative assessment of underpinning knowledge, to the extent it is required, and formative assessment of application skills may be conducted through simulations.

2. **Interdependent Assessment of Units**

   Within the Leadership and Management competency suite, there are a range of units which lend themselves to holistic assessment strategies.

   This unit covers two primary functions or outcomes being the promotion of a harmonious workplace and the development of effective work values. It therefore represents an activity which may result in a range of other management and technical competencies being invoked.

   For these reasons, it would be normal for the assessment of this unit to be handled as an individual entity.

3. **Critical Aspects of Evidence.** The Industry has established that, for portability purposes, it is essential that competency in this unit reflects successful assessment in the critical aspects of behaviours and outcomes which require the candidate to:

   - develop working relationships and processes
   - develop trust and support
   - conduct open and timely consultation
   - honour commitments
   - support employees
   - provide feedback
   - resolve disagreements
   - establish work values.

4. **Consistency of Performance.** Consistency of performance in this unit is aided by the standards of performance which are contained within State Legislation and by professional standards and practices established and observed by the Industry.

**UNDERPINNING KNOWLEDGE**
5. Underpinning Knowledge and Skills. A knowledge of the listed topics/disciplines in sufficient scope and depth to enable the candidate to achieve positive results by the effective management of group processes.

A knowledge of:

- industrial awards/enterprise agreements
- advanced negotiation techniques
- human resource management
- strategic planning
- resource quantification
- organisational change and development
- occupational health and safety
- statutory and site rules, policies, procedures and regulations
- assertive techniques
- risk management processes and techniques
- action planning methods.

**UNDERPINNING SKILLS**

6. The ability to:

- act in an assured and unhesitating manner when faced with a challenge
- say no to unreasonable requests
- state your own position and views clearly in conflict situations
- maintain your beliefs, commitment and effort in spite of set-backs or opposition
- show integrity and fairness in decision-making
- set objectives and create cultures which are ethical
- clearly identify and raise ethical concerns relevant to your minesite
- work towards the resolution of ethical dilemmas based on reasoned approaches
- actively build relationships with others
- make time available to support others
- provide feedback designed to improve people's future performance
- show respect for the views and actions of others
- show sensitivity to the needs and feelings of others
- keep others informed about plans and progress
- identify the information needs of listeners
- listen actively, ask questions, clarify points and rephrase others' statements to check mutual understanding
- adopt communications styles appropriate to listeners and situations, including selecting an appropriate time and place
- accept personal comments or criticism without becoming defensive
- remain calm in difficult or uncertain situations
- handle others' emotions without becoming personally involved in them
- reconcile and make use of a variety of perspectives when making sense of a situation
- produce own ideas from experience and practice
- take decisions which are realistic for the situation
- focus on facts, problems and solutions when handling an emotional situation.
## KEY COMPETENCIES

<table>
<thead>
<tr>
<th>Key Competency</th>
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<td>Using technology</td>
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</table>
**MNIL09A Manage major incidents and emergencies**

**Description:** This unit covers the provision of leadership during and after a major incident and/or emergency. Its application involves strategic management functions including resource co-ordination, interaction with employees and their families and dealing with the media.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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</thead>
<tbody>
<tr>
<td><strong>L9.1 Review Mine Emergency Preparedness and Response Systems.</strong></td>
<td><strong>L9.1.1</strong> The emergency preparedness plan is reviewed and confirmed for relevance and timeliness on a regular basis.</td>
</tr>
<tr>
<td></td>
<td><strong>L9.1.2</strong> The organisational structure for the management of emergency preparedness and response is reviewed for relevance and accuracy on a regular basis.</td>
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<tr>
<td></td>
<td><strong>L9.1.3</strong> Emergency response procedures for management of classes of incident are reviewed for relevance and accuracy on a regular basis.</td>
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<tr>
<td></td>
<td><strong>L9.1.4</strong> Emergency response procedures for management of decision making processes and decision monitoring systems are confirmed.</td>
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<tr>
<td></td>
<td><strong>L9.1.5</strong> Plans are confirmed with relevant stakeholders and specialists.</td>
</tr>
<tr>
<td><strong>L9.2 Manage the Incident/Emergency Response.</strong></td>
<td><strong>L9.2.1</strong> Incident information receival and recording systems are accessed in accordance with site requirements.</td>
</tr>
<tr>
<td></td>
<td><strong>L9.2.2</strong> Emergency response and evacuation plans and procedures are accessed and applied in accordance with site requirements.</td>
</tr>
<tr>
<td></td>
<td><strong>L9.2.3</strong> Operations facilities, including communications to support them, are established in accordance with the emergency plan.</td>
</tr>
<tr>
<td><strong>L9.2 Manage the Incident/Emergency Response. (continued)</strong></td>
<td><strong>L9.2.4</strong> Action planning processes to manage the situation/incident are applied in accordance with the emergency plan.</td>
</tr>
<tr>
<td></td>
<td><strong>L9.2.5</strong> Required services, personnel, equipment and resources for the incident are identified and applied in accordance with the emergency plan.</td>
</tr>
</tbody>
</table>
| | **L9.2.6** Roles and responsibilities, as specified in the
emergency response and evacuation plans and procedures are confirmed, clarified and communicated to all persons.

L9.3 Access and Respond to Information, Advice and Support.

L9.3.1 Specialist technical and professional staff are brought together to review the situation.

L9.3.2 Plans are developed to deal with immediate areas of concern including:
− employee welfare
− dealing with the media
− legal issues
− environmental aspects
− informing the community.

L9.3.3 Individuals roles and responsibilities are clarified and confirmed.

L9.4 Apply Post-Incident Management Procedures.

L9.4.1 Processes to investigate nature and cause of situation/incident are determined and established in accordance with statutory and site requirements.

L9.5 Audit and Review the Effectiveness of the Incident/Emergency Management Response.

L9.5.1 Response systems are audited for effectiveness and compliance with statutory and management plan standards.

L9.5.2 Incident/emergency management response processes are audited for effectiveness and for compliance with statutory and mine site requirements.

L9.5.3 Recording systems are audited for effectiveness and for compliance with the emergency preparedness and response plan.

L9.5.4 Instances of non-compliance or other discrepancies/deficiencies revealed by audit are responded to promptly and the incident/emergency management system is modified accordingly.

**DEFINITION OF TERMS**

For the purposes of this standard, the definition below applies:

**audit**

a systematic examination against defined criteria to determine whether activities and related results conform to planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve the organisation's policy and objectives.
**consequence**
the outcome of an event of situation expressed qualitatively or quantitatively, being a loss, injury, disadvantage or gain.

**cost**
of activities, both direct and indirect, involving any negative impact, including money, time, labour, disruption, goodwill, political and intangible losses.

**frequency**
a measure of likelihood expressed as the number of occurrences of an event in a given time.

**hazard**
a source or a situation with a potential for harm in terms of human injury or ill-health, damage to property, damage to the environment, or a combination of these.

**hazard identification**
the process of recognising that a hazard exists and defining its characteristics.

**likelihood**
used as a qualitative description of probability and frequency.

**loss**
any negative consequence, financial or otherwise.

**monitor**
to check, supervise, observe critically, or record the progress of an activity, action or system on a regular basis in order to identify change.

**probability**
the likelihood of a specific outcome, measured by the ratio of specific outcomes to the total number of possible outcomes. Probability is expressed as a number between 0 and 1, with 0 indicating an impossible outcome and 1 indicating an outcome is certain.

**risk**
the combination of the frequency, or probability of occurrence, and consequence of a specified hazardous event.

**risk acceptance**
an informed decision to accept the likelihood and the consequences of a particular risk.

**risk analysis**
a systematic use of available information to determine how often specified events may occur and the magnitude of their likely consequences.

**risk assessment**
the overall process of estimating the magnitude of risk and deciding what actions will be taken.

**standard operating procedures (SOP)**
are also known as safe working procedures, safe operating procedures and standard working procedures.

**post-incident management**
is the control of activities arising from an incident and can include: legal advice, environmental aspects, critical incident stress debriefing, interviewing, investigations, witness interview statements, restoration of normal operations, media releases, public relations, employee welfare and family support, security of evidence, liaison with...
statutory/legal bodies, statutory investigations, review of emergency procedures, documentation of ongoing operations, restoration of emergency preparedness

**RANGE OF VARIABLES**

This competency standard is applicable for those with managerial responsibilities. This may be as a Senior/Specialist Manager or as an owner of a business. These competencies may be applicable in combination with other industries, occupations or workplace specific competencies.

It is to be exhibited in the work area of managerial responsibility which might be an entire enterprise or department of an enterprise.

The competency involves application of relevant legislation and codes of practice, and the maintenance of records, provision of information and dealing with committees, statutory/legal agencies and organisational representatives. Processes for consultation include committees, consultation with statutory/legal agencies/site representatives, issue resolution procedures and participative/consultative procedures conducted by supervisory staff within the area of managerial responsibility.

Monitoring of activities may include review of written reports, performance appraisal or auditing procedures.

**Types of incident can be identified as, but not limited to:**
- chemical injury
- entrapment
- equipment damage
- fire
- fugitive chemicals
- inundation
- irrespirable atmosphere
- personnel injury or death
- rock fall
- unscheduled explosion.

**Incidents can be caused by, but are not limited to:**
- aircraft accident
- bulk-head collapse
- explosives
- flammable solids or liquids
- hazchem
- inrush
- mining induced subsidence
- outburst
- release of stored energy
- seismic event
- sulphide dust explosion
- vehicle accidents
- vehicle fire.

**Stakeholders and other consulting partners can include, but are not limited to:**
- ambulance
- board of directors
- contractors
- critical incident stress debriefing organisations
- customers
- emergency management and assistance organisations
- employee representatives
- employees
- families
- fire brigade
- government mining authorities
- hospital
- insurance companies
- local community
- local government
- manufacturers
- medical staff
- mines rescue service
- police
- specialist professionals
- suppliers.

**Required services and resources can include, but are not limited to:**
- internal mine services and resources
- contractors
- suppliers
- local community
- manufacturers
- inspectorate
- police
- mines rescue services
- fire brigade
- ambulance
- medical staff
- hospital
- critical incident stress debriefing organisations
- local emergency management organisations
- local government
- media
- coroner's representative
- security services
- solicitors
- workers representatives
- other mines
- experts such as engineers, scientists
- down-hole camera
- drill rigs
- forensic.

**Communications can include:**
- radio
- telephone
- telemetry
- verbal
- written
- computers
- runners
- mirrors
- signals
- stench gas
- alarms/sirens.

**Equipment refers to that needed to control the incident and includes but is not restricted to:**
- rescue equipment
- mining equipment
- transport
- specialised equipment from external sources
- monitoring and analysis equipment
- breathing apparatus.

**Media can include:**
- radio
- print media
- television.

**Operations facilities are those which are set up to manage an incident and can include, but are not restricted to:**
- operations centre
- press room
- mortuary
- muster areas
- meeting rooms
- communications centres and networks.

**Future operations can include, but are not restricted to:**
- sealing mine areas
- restoration to full production
- suspension of operations
- full closure of mine.

**Statutory/legal compliance may include but is not limited to:**
- common law
- coroner
- dangerous goods
• development of training policies/programs to aid compliance
• emergency services
• environmental

• explosives
• gas and petroleum
• industrial relations
• local government
• minerals and extractive industry licensing
• mines act
• navigation
• planning and assessment
• road traffic
• safety and health
• trade practices
• waterways
• weights and measures
• workers compensation/workcover.

Actions are to be in accordance with all relevant statutory/legal requirements, particularly:
• requirements for the maintenance of records for statutory/legal breaches
• provision of information and training
• regulations, codes of practice and guidelines relating to statutory/legal compliance
• site representatives and committees
• issue resolution.

Resources may include, but are not limited to:
• people
• finance
• equipment
• environment
• buildings/facilities
• technology
• information.

Negotiations may be with a variety of internal or external sources and be:
• formal or informal
• short term or ongoing
• multi-lingual and cross-cultural
• enterprise agreements
• legislation regulation compliance
and include relative authorities, project managers, employees, contractors, customers and the community.

EVIDENCE GUIDE
This guideline is to assist the development of assessment instruments/tools to assess the competence of mine managers. At this level, mining managers must provide evidence of consistent achievement of this Unit's workplace outcomes.

1. Context of Assessment

The ultimate competency outcome is for the candidate to be able to manage major incident/emergency response requirements and, in so doing, to satisfy the performance criteria and underpinning knowledge requirements agreed by the industry in this Competency Unit.

Incident/emergency management response circumstances and requirements will differ markedly between mine sites. Therefore, there are limitations on the extent to which the practical management of major incidents/emergencies may be assessed in the workplace. To bridge this potential gap and to ensure the candidate is able to apply the extensive theory to a working situation, assessment is likely to include formal simulation exercises.

The assessment system for this competency is to cover the following:

A. Theory and knowledge underpinning the competency which is a mandatory requirement

B. Application of theory to a generic practical situation/simulation which is a mandatory requirement

OR

C. Practical management of a major incident/emergency response or equivalent activity.

There are special considerations in respect of Assessment C. It is unlikely that all candidates will be able, in terms of access, reasonable economic constraints and reasonable time frames, to physically carry out this function. In most cases it would be reasonable to infer competency if a candidate has completed assessments A and B and has either satisfied assessment C or has completed a recognised training exercise involving the management of major incidents and/or emergencies.

2. Interdependent Assessment of Units

Whilst there are some common features between the units at this level, commonality is generally limited to science and engineering theory and the planning process. This unit requires the specialised application of knowledge. Generalised assessment is unlikely to satisfy the requirements of this unit or of the other allied units.

Unless inter-dependent assessment can be clearly demonstrated to satisfy the specialised requirements of each subject unit, and do so in a transparent and timely manner, the assessment should be on a unit by unit basis.

This unit covers five primary functions or outcomes, being the review of the mine emergency preparedness and response systems, the management of incident/emergency response, accessing and responding to advice and support, applying post-incident management procedures and auditing and reviewing the effectiveness of the
incident/emergency management response. It therefore represents an analysis activity that may result in a range of other management and technical competencies being invoked.

3. **Critical Aspects of Evidence.** The Industry has established that, for portability purposes, it is essential that competency in this unit reflects successful assessment in the critical aspects of behaviours and outcomes which require the candidate to:

- review emergency preparedness planning for mines
- implement response procedures for management of different classes of incident/emergency
- identify the roles of stakeholders and specialists at incidents/emergencies
- implement the structure and roles of on-site functions and personnel
- organise and co-ordinate information gathering, analysis and communication
- implement action plan development and evaluation
- establish incident operations facilities
- implement incident management planning
- apply post-incident management procedures
- audit and review incident/emergency management response.

4. **Consistency of Performance.** Consistency of performance in this unit is aided by the standards of performance which are contained within State legislation and by professional standards and practices established and observed by the Industry.

**UNDERPINNING KNOWLEDGE**

5. Underpinning Knowledge. A knowledge of the listed topics / disciplines in sufficient scope and depth to enable the candidate to establish mine emergency preparedness and response systems.

A knowledge of:

- audit review process and techniques
- call-out procedures
- classification of types of incidents
- decision making processes
- deployment of staff underground
- economic considerations and decisions
- effects of heat and humidity
- effects of visibility
- emergency and disaster planning processes and techniques
- emotional effects of emergencies on rescuers and mine personnel
- environmental risks and controls
- equipment handling
- equipment required for different types of emergency
- escape strategies and technology
- hazard identification
- incident resources and how to access them
- industry and legislative stakeholders
• insurance policies and considerations
• intervention and control techniques for heating, fires, explosions, outburst, extrication or inrushes
• legal implications of incidents
• legal requirements of incident management teams
• legislation applicable to mines
• legislation regarding resumption of normal operations
• legislative requirements
• media policies and procedures
• mine closure procedures and the legislative implications
• mine rescue guidelines and capabilities
• mine-type incidents and risks
• numbers needed to run the mine at planned operational levels
• rescue team structure, procedures and equipment, and standby team requirements
• risk management principles and techniques
• scaling procedures and the legislative implications
• self-escape philosophies, systems and equipment
• services and agencies available to assist in an emergency
• structure of emergency guidelines
• structure of emergency organisations
• structure, roles, capabilities and operational limitations of external resources and agencies used during mines incidents
• support services role and access
• the requirements and structure for fresh air base/refuge chambers
• the role of stakeholders
• the techniques and equipment used for collecting and analysing atmospheric conditions
• titles and roles of members of incident management team
• training and assessment principles
• ventilation and its influence on incidents, and decisions to be made.

**UNDERPINNING SKILLS**

6. **The ability to:**
• access and use mine-site information and recording systems
• analyse information
• assess hazards and associated risks
• brainstorm to collect maximum information
• carry out fault-tree analyses
• communicate effectively with members of the media
• communicate effectively with people personally or through technical devices during incidents
• delegate responsibility and tasks
• develop action plans
• effectively interview
• effectively question
• evaluate systems and equipment
- facilitate groups to work together
- formulate and develop emergency preparedness plans
- identify or establish mine-site facilities for incident management
- make effective decisions
- organise personnel and resources
- participate as a team member
- read and interpret mine plans
- write reports.

### KEY COMPETENCIES

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## MNIL10A Evaluate and respond to business influences

**Description:** This unit covers the evaluation and improvement of the minesite's business potential. Its application involves reviewing the minesite's external operating environment, evaluation of competitors and collaborators, developing good relationships with stakeholders and reviewing minesite structures and systems.

<table>
<thead>
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<th>ELEMENT</th>
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<tbody>
<tr>
<td>L10.1 Identify and Analyse the Minesite's External Operating Environment.</td>
<td>L10.1.1 The external operating environment analysis is cost effective and based on sufficient, valid and reliable information.</td>
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<tr>
<td></td>
<td>L10.1.2 The external operating environment analysis identified emerging and predicted trends.</td>
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<td></td>
<td>L10.1.3 Analysis takes into account likely future interests and activities of the minesite and other relevant organisations.</td>
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<td></td>
<td>L10.1.4 Opportunities to modify the external environment in favour of the minesite are taken.</td>
</tr>
<tr>
<td>L10.2 Evaluate Competitors and Collaborators.</td>
<td>L10.2.1 Information gathering is cost effective and consistent with the minesite values and policies.</td>
</tr>
<tr>
<td></td>
<td>L10.2.2 The strengths and weaknesses of competitors and collaborators are accurately identified in time to be of use to the minesite.</td>
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<tr>
<td></td>
<td>L10.2.3 Evaluation of competitors and collaborators takes account of current trends and developments, and of the likely future interests and activities of the minesite.</td>
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<td></td>
<td>L10.2.4 The case for collaboration with others is supported by evidence, indicates mutual benefits and risks, and is consistent with the minesite's values, mission and objectives.</td>
</tr>
<tr>
<td>L10.2 Evaluate Competitors and Collaborators. (continued)</td>
<td>L10.2.5 Changes to the minesite's plans are consistent with the information gathered on competitors and collaborators.</td>
</tr>
<tr>
<td>L10.3 Develop Effective Relationships with</td>
<td>L10.3.1 Stakeholders and their interests are identified in a way which is realistic, comprehensive, and</td>
</tr>
</tbody>
</table>
Stakeholders. takes account of current and likely future activities of the minesite.

L10.3.2 Methods to identify stakeholders' interests are consistent with minesite and legal requirements.

L10.3.3 Consultation with stakeholders generates trust and an open expression of interest.

L10.3.4 Conflict between stakeholders' interests and the minesite's interests is resolved in ways which are consistent with the minesite's objectives, values and policies.

L10.3.5 Action to secure the support of stakeholders is timely and effective.

L10.3.6 Response to actual or potential hindrance by stakeholders is prompt, effective and consistent with maintaining good relations.

L10.4 Review the Minesite's Structures and Systems.

L10.4.1 Provide opportunities for people throughout the minesite to make suggestions for improvements to structures and systems.

L10.4.2 Identify opportunities and obstacles in structures and systems, taking account of current and likely future requirements of the minesite.

L10.4.3 Consultation with those affected by proposed improvements is taken in time for their views to be considered.

L10.4.4 Proposed improvements are justified on the basis of known factors and take into account the needs and expectations of stakeholders.

L10.4.5 Plans are presented clearly identifying the nature and benefits of the improvements and the implications for those affected.

**DEFINITION OF TERMS**

For purposes of consistency, the following definitions have been applied in this standard.

- **collaborators**: organisations or individuals with whom the minesite could undertake joint initiatives to mutual advantage

- **competitors**: similar organisations who are competing for the same markets or positions in the market

- **external operating**: all the conditions in which the minesite works; these may
environment  include the legal framework, market trends, economic and social factors, political and geographical considerations or demographic changes

review  the ongoing or regular process of information collection, assessment and, where necessary, improvement

stakeholders  all those who have an interest in, or may be affected by, the minesite and its activities; stakeholders may include, for example, shareholders, directors, employees, customers, suppliers, local communities and many others

trends  identifiable and significant movements, for example, in customers needs and demand, in technology or in market size.

**RANGE OF VARIABLES**

This competency standard is applicable for those with managerial responsibility.

It is to be exhibited in the work area of responsibility which would typically be a mine site. This competency involves relevant legislation and codes of practice, and the maintenance of records, provision of information and training and the dealing with committees, statutory/legal agencies and site personnel.

Processes for consultation may include committees, consultation with statutory/legal agencies/site representatives, issue resolution procedures and participative/consultative procedures conducted by supervisory staff within the area of managerial responsibility.

Monitoring of activities may include review of written reports, performance appraisal or auditing procedures.

**Statutory/legal compliance may include but is not limited to:**
- common law
- dangerous goods
- development of training policies/programmes to aid compliance
- industrial relations
- industry licensing
- local government
- mines act
- navigation
- planning and assessment
- trade practices
- waterways
- weights and measures
- workers compensation/workcover.

**All actions are to be in accordance with all relevant statutory/legal requirements, particularly:**
- requirements for the maintenance of records for statutory/legal breaches
- provision of information and training
• regulations and codes of practice relating to statutory/legal compliance
• site representatives and committees
• issue resolution.

Management operates within:
• work schedules may include shift work and varying hours of duty
• environments ranging from simple to complex and diverse
• appropriate policies, guidelines and processes
• a level of autonomy which may range from limited to substantial
• quality and continuous improvement processes and standards
• business and performance plans
• ethical standards established by the organisation
• productivity and profitability objectives and targets
• best practice and benchmarking principles and practices
• legislation, codes and practices
• resource parameters which may be defined or negotiated
• training and development principles and practices
• human resource policies and practices including interviewing, counselling, dispute settling and discipline
• financial accountability including profit and loss statements
• enterprise/industrial agreements/awards.

Management may assume varying roles including:
• leader
• coach
• facilitator
• mentor
• participant
• director
• trainer
• assessor.

Management will typically make decisions to:
• maintain statutory/legal compliance
• influence operational performance
• plan production schedules
• maximise production and minimise operating costs/risks and non-conformances
• analyse and review market/production predictions and costs
• manage projects and tasks.

Resources may include, but are not limited to:
• people
• finance
• equipment
• environment
• buildings/facilities
• technology
• information.
Negotiations may be with a variety of internal or external sources and be:
- formal or informal
- short-term or ongoing
- multi-lingual and cross-cultural
- enterprise agreements
- legislation regulation compliance and include relative authorities, project managers, employees, contractors, customers and the community.

Consultation would typically include:
- regulatory authorities
- tenderers
- project managers
- contractors
- employees
- community
- customers
- suppliers.

**EVIDENCE GUIDE**

This guideline is to assist the development of assessment instruments/tools to assess the competence of mining managers. At this level, mining managers must provide evidence of consistent achievement of this Unit's workplace outcomes.

1. **Context of Assessment**

   Leadership and Management competency development in the Industry is to be designed to optimise aided learning of the essential underpinning knowledge and mentored workplace development of application skills.

   The context of summative assessment should, to the maximum possible extent, be integrated with real work activities being completed by the candidate.

   Summative assessment of underpinning knowledge, to the extent it is required, and formative assessment of application skills may be conducted through simulations.

2. **Interdependent Assessment of Units**

   Within the Leadership and Management competency suite, there are a range of units which lend themselves to holistic assessment strategies.

   This unit covers four primary functions or outcomes being the analysis of the external operating environment, evaluation of competitors and collaborators, the development of effective relationships with stakeholders and the review of structures and systems. It therefore represents a series of activities which may result in a range of other management and technical competencies being invoked.

   For these reasons, it would be normal for the assessment of this unit to be handled as an individual entity.
3. **Critical Aspects of Evidence.** The Industry has established that, for portability purposes, it is essential that competency in this unit reflects successful assessment in the critical aspects of behaviours and outcomes which require the candidate to:

- analyse the external operating environment
- analyse emerging and predicted trends
- establish strategies, structures and frameworks for the identification of opportunities
- evaluate competitors and collaborators
- evaluate cost effectiveness
- identify stakeholders and their interests
- develop effective relationships with stakeholders
- identify opportunities and obstacles in structures and systems
- improve minesite structures and systems.

4. **Consistency of Performance.** Consistency of performance in this unit is aided by the standards of performance which are contained within State legislation and by professional standards and practices established and observed by the Industry.

**UNDERPINNING KNOWLEDGE**

5. A knowledge of the listed topics/disciplines in sufficient scope and depth to enable the candidate to review the minesite's external operating environment, evaluate competitors and collaborators, develop good working relationships with stakeholders and review minesite structures and systems.

A knowledge of:

- strategic planning
- industrial awards/enterprise agreements
- occupational health and safety
- advanced negotiation techniques
- organisational change and development
- statutory and site rules, policies, procedures and regulations
- assertive techniques
- risk management processes and techniques
- action planning methods.

**UNDERPINNING SKILLS**

6. The ability to:

- research, acquire and use information within responsibility and authority in a diverse and complex workplace
- understand the culture of the minesite and act to work within it or influence it
- display an understanding of how the different parts of the minesite and its environment fit together
- clearly related goals and actions to the strategic aims of the minesite
- work towards a clearly defined vision of the future
- take opportunities when they arise to achieve the longer-term aims or needs of your minesite
- develop and use contacts to trade information, and obtain support and resources
- create and prepare strategies for influencing others
- adopt communication styles appropriate to listeners and situations, including selecting an appropriate time and place
- present yourself positively to others
- establish information networks to search for and gather relevant information
- make best use of existing sources of information
- seek information from multiple sources
- challenge the validity and reliability of sources of information
- use own experience and evidence from others to identify problems and understand situations
- identify patterns or meaning from events and data which are not obviously related
- produce a variety of solutions before taking a decision
- take decisions which are realistic for the situation
- monitor and introduce ways to improve products/services
- develop and maintain effective communication with customers
- use effective consultative processes.

### KEY COMPETENCIES

<table>
<thead>
<tr>
<th>Key Competency</th>
<th>Level 1</th>
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<th>Level 3</th>
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<tbody>
<tr>
<td>Collecting, analysing &amp; organising information</td>
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</table>
MNIL11A Resource minesite plans and objectives

Description: This unit covers the management of the minesite's resources, both financial and material. Its application provides for the allocation of resources, the development and maintenance of budgets, evaluation of expenditure proposals and acquiring the resources to meet plans and objectives.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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</thead>
<tbody>
<tr>
<td>L11.1</td>
<td>Review the Allocation of Resources.</td>
</tr>
<tr>
<td>L11.1.1</td>
<td>Systems for reviewing the allocation of resources provide accurate, comprehensive and up-to-date information.</td>
</tr>
<tr>
<td>L11.1.2</td>
<td>Criteria used includes industry accepted performance measures for the allocation of resources.</td>
</tr>
<tr>
<td>L11.1.3</td>
<td>The review indicates the performance of the minesite in comparison with other minesites.</td>
</tr>
<tr>
<td>L11.1.4</td>
<td>The review shows how effective the minesite's methods are compared to alternative methods of allocating resources.</td>
</tr>
<tr>
<td>L11.1.5</td>
<td>Gather, store and use information on the allocation of resources in accordance with minesite policies and legal requirements.</td>
</tr>
<tr>
<td>L11.2</td>
<td>Evaluate Proposals for Expenditure.</td>
</tr>
<tr>
<td>L11.2.1</td>
<td>Selected expenditure evaluation criteria are relevant, fair and clear.</td>
</tr>
<tr>
<td>L11.2.2</td>
<td>Proposals are evaluated against the stated criteria within the agreed timescale.</td>
</tr>
<tr>
<td>L11.2.3</td>
<td>Proposals are evaluated for their expected benefits and costs.</td>
</tr>
<tr>
<td>L11.2.4</td>
<td>The accepted proposals clearly show how they support the minesite's objectives, strategies, values and policies.</td>
</tr>
<tr>
<td>L11.2.5</td>
<td>Weaknesses or inconsistencies in proposals are highlighted to form a justifiable case for rejection or amendment.</td>
</tr>
<tr>
<td>L11.2.6</td>
<td>Negotiations over proposals are conducted in a manner likely to ensure the co-operation, confidence and goodwill of the people</td>
</tr>
</tbody>
</table>
L11.3 Develop and Maintain Minesite Budgets.

L11.3.1 Financial information is analysed and interpreted for profit/productivity performance.

L11.3.2 Performance and financial systems and processes are accessed to assess progress in achieving profit/productivity plans and targets.

L11.3.3 Develop, monitor and maintain the minesite's annual budget.

L11.3.4 Systems, procedures and records associated with documenting resource acquisition and usage are managed in accordance with the minesite policies and legal requirements.

L11.4 Obtain Resources for the Minesites Activities.

L11.4.1 The case for obtaining resources is clear, consistent and supported by sound argument.

L11.4.2 When the resources required are not fully realised, realistic alternative courses of action are pursued.

L11.4.3 All agreements, communications and other activities to obtain resources are consistent with the mission, values and policies of the minesite.

**DEFINITION OF TERMS**

For purposes of consistency, the following definitions have been applied in this standard.

- **activities**: methods of obtaining financial resources for programmes and plans
- **allocation of financial resources**: how finance is distributed within the minesite to support its various programmes and plans
- **criteria**: principles or standards against which proposals can be evaluated
- **evaluation**: a balanced assessment of what has been achieved against plans
- **generation of financial resources**: raising the finances necessary to achieve the minesite's plans
- **legal requirements**: laws relevant to the management of the minesite's finances and methods of generating finance
measures methods of assessing how well the minesite is performing

mission the long-term goal of the minesite

negotiation the process of reaching agreement with those who are making proposals

minesite objectives clearly defined and measurable results which the minesite is scheduled to achieve

policies guidelines which cover the way the minesite deals with key issues

proposals requests for financial support for programmes or plans which are submitted for approval

review the ongoing or regular process of information collection, assessment and, where necessary, improvement

strategies long-term plans which guide the minesite in working towards its mission

values those things the minesite believes in and seeks to realise in its work

RANGE OF VARIABLES

This competency standard is applicable for those with managerial responsibility.

It is to be exhibited in the work area of responsibility which would typically be a mine site. This competency involves relevant legislation and codes of practice, and the maintenance of records, provision of information and training and the dealing with committees, statutory/legal agencies and site personnel.

Processes for consultation may include committees, consultation with statutory/legal agencies/site representatives, issue resolution procedures and participative/consultative procedures conducted by supervisory staff within the area of managerial responsibility.

Monitoring of activities may include review of written reports, performance appraisal or auditing procedures.

Statutory/legal compliance may include but is not limited to:

- common law
- dangerous goods
- development of training policies/programmes to aid compliance
- industrial relations
- industry licensing
- local government
- mines act
- navigation
• planning and assessment
• trade practices
• waterways
• weights and measures
• workers compensation/workcover.

All actions are to be in accordance with all relevant statutory/legal requirements, particularly:
• requirements for the maintenance of records for statutory/legal breaches
• provision of information and training
• regulations and codes of practice relating to statutory/legal compliance
• site representatives and committees
• issue resolution.

Management operates within:
• work schedules may include shift work and varying hours of duty
• environments ranging from simple to complex and diverse
• appropriate policies, guidelines and processes
• a level of autonomy which may range from limited to substantial
• quality and continuous improvement processes and standards
• business and performance plans
• ethical standards established by the organisation
• productivity and profitability objectives and targets
• best practice and benchmarking principles and practices
• legislation, codes and practices

• resource parameters which may be defined or negotiated
• training and development principles and practices
• human resource policies and practices including interviewing, counselling, dispute settling and discipline
• financial accountability including profit and loss statements
• enterprise/industrial agreements/awards.

Management may assume varying roles including:
• leader
• coach
• facilitator
• mentor
• participant
• director
• trainer
• assessor.

Management will typically make decisions to:
• maintain statutory/legal compliance
• influence operational performance
• plan production schedules
• maximise production and minimise operating costs/risks and non-conformances
• analyse and review market/production predictions and costs
- manage projects and tasks.

**Resources may include, but are not limited to:**
- people
- finance
- equipment
- environment
- buildings/facilities
- technology
- information.

**Negotiations may be with a variety of internal or external sources and be:**
- formal or informal
- short term or ongoing
- multi-lingual and cross-cultural
- enterprise agreements
- legislation regulation compliance and include relative authorities, project managers, employees, contractors, customers and the community.

**Consultation would typically include:**
- regulatory authorities
- tenderers
- project managers
- contractors
- employees
- community
- customers
- suppliers.

### EVIDENCE GUIDE

**Evidence Guide**
This guideline is to assist the development of assessment instruments/tools to assess the competence of mining managers. At this level, mining managers must provide evidence of consistent achievement of this Unit's workplace outcomes.

1. **Context of Assessment**

   Leadership and Management competency development in the Industry is to be designed to optimise aided learning of the essential underpinning knowledge and mentored workplace development of application skills.

   The context of summative assessment should, to the maximum possible extent, be integrated with real work activities being completed by the candidate.

   Summative assessment of underpinning knowledge, to the extent it is required, and formative assessment of application skills may be conducted through simulations.

2. **Interdependent Assessment of Units**
Within the Leadership and Management competency suite, there are a range of units which lend themselves to holistic assessment strategies.

This unit covers four primary functions or outcomes being the generation and allocation of resources, the evaluation of expenditure proposals, developing and maintaining the minesite's budget and the resourcing of activities. It therefore represents a process which may result in a range of other management and technical competencies being invoked.

For these reasons, it would be normal for the assessment of this unit to be handled as an individual entity.

3. **Critical Aspects of Evidence.** The Industry has established that, for portability purposes, it is essential that competency in this unit reflects successful assessment in the critical aspects of behaviours and outcomes which require the candidate to:

- establish strategies, structures and frameworks for the allocation of resources
- analyse and determine the review process
- review targets and resources
- review financial planning and management processes
- evaluate expenditure proposals
- evaluate cost effectiveness
- gathering, storing and using information.

4. **Consistency of Performance.** Consistency of performance in this unit is aided by the standards of performance which are contained within State Legislation and by professional standards and practices established and observed by the Industry.

**UNDERPINNING KNOWLEDGE**

5. A knowledge of the listed topics/disciplines in sufficient scope and depth to enable the candidate to allocate resources, develop and maintain budgets, evaluate expenditure proposals and acquire the resources to meet plans and objectives.

**A knowledge of:**

- financial analysis, planning and management
- advanced communication techniques
- critical path analysis, planning methods and techniques
- corporate, group and individual goal setting techniques
- corporate planning models and techniques
- leadership models
- human resource management
- assertive techniques
- risk management processes and techniques
- advanced negotiation techniques
- action planning methods
- industrial awards/enterprise agreements
- occupational health and safety.
UNDERPINNING SKILLS

6. The ability to:

- understand how the different parts of the minesite and its environment fit together
- work towards a clearly defined vision of the future
- clearly relate your goals and actions to the strategic aims of the minesite
- take opportunities when they arise to achieve the longer-term aims or needs of your minesite
- listen actively, ask questions, clarify points and rephrase others’ statements to check mutual understanding
- adopt communication styles appropriate to listeners and situations, including selecting an appropriate time and place
- develop and use contacts to trade information, and obtain support and resources
- present yourself positively to others
- create and prepare strategies for influencing others
- understand the culture of the minesite and act to work within it or influence it
- actively encourage the free exchange of information
- make best use of existing sources of information
- seek information from multiple sources
- challenge the validity and reliability of sources of information
- push for concrete information in an ambiguous situation
- break processes down into tasks and activities
- identify patterns or meaning from events and data which are not obviously related
- produce a variety of solutions before taking a decision
- take decisions which are realistic for the situation.

KEY COMPETENCIES

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</table>
**MNIL12A Evaluate and enhance minesite performance**

**Description:**
This unit covers the use of appropriate measures and criteria to review and evaluate minesite performance. Its application provides for the conduct of review, evaluation of findings and the presentation and explanation of these to stakeholders. Its application ensures continuous improvement as it requires follow-up on evaluation findings.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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<tbody>
<tr>
<td>L12.1</td>
<td>Develop Measures and Criteria To Evaluate the Minesite's Performance.</td>
</tr>
<tr>
<td></td>
<td>L12.1.1 Measures and criteria developed are cost effective and make optimum use of existing sources of data and means of data gathering.</td>
</tr>
<tr>
<td></td>
<td>L12.1.2 Measures and criteria developed provide sufficient information to make judgements.</td>
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<tr>
<td></td>
<td>L12.1.3 Measures and criteria developed are capable of providing relevant and timely information to enable an effective response to achieve the minesite objectives.</td>
</tr>
<tr>
<td>L12.2</td>
<td>Evaluate the Minesite's Performance and Present the Results.</td>
</tr>
<tr>
<td></td>
<td>L12.2.1 Evaluation of the minesite's performance is based on sufficient, reliable evidence against agreed criteria, taking account of all relevant factors.</td>
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<tr>
<td></td>
<td>L12.2.2 Presentation of evaluation results gives a complete and balanced picture of the minesite's performance.</td>
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<tr>
<td></td>
<td>L12.2.3 Reasons for performance not meeting agreed criteria are identified and discussed with stakeholders.</td>
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<tr>
<td></td>
<td>L12.2.4 Evaluations and presentation of results are consistent with minesite values and policies and within legislative requirements.</td>
</tr>
<tr>
<td>L12.3</td>
<td>Explain the Cause of Success or Failure in Minesite Performance.</td>
</tr>
<tr>
<td></td>
<td>L12.3.1 Explanations of the cause of success or failure are based on sufficient, reliable evidence.</td>
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<tr>
<td></td>
<td>L12.3.2 Explanations of minesite performance are accurate, clear, concise and appropriate to the audience.</td>
</tr>
<tr>
<td></td>
<td>L12.3.3 Alternate explanations for minesite performance</td>
</tr>
</tbody>
</table>
are evaluated, considered and presented.

L12.3.4 Lessons drawn from success or failure are incorporated in future minesite planning and continuous improvement activities.


L12.4.1 Plans are adjusted and communicated to those who have a role in their development and implementation.

L12.4.2 Individuals/teams are informed of savings and productivity improvements in achieving the business objectives.

L12.4.3 Work performance is documented and the information is used to identify opportunities for further improvement.

L12.4.4 Records, reports and recommendations for improvement are managed within the minesites systems and processes.

**DEFINITION OF TERMS**

For purposes of consistency, the following definitions have been applied in this standard.

**criteria** principles or standards against which performance can be evaluated

**evaluation** a balanced assessment of what has been achieved

**measures** methods of assessing how well your minesite is performing

**mission** the long-term goal your minesite seeks to achieve

**objectives** clearly defined and measurable results which your minesite should achieve

**policies** guidelines covering the way your minesite deals with key issues, for example, health and safety, employment practices or customer relations

**strategies** long-term plans which will guide your minesite in achieving its mission

**values** those things your minesite believes in and seeks to realise in its work, for example, customer service, team working, quality or value for money

**vision** the model for the way you would like your minesite to be in the future

**RANGE OF VARIABLES**

This competency standard is applicable for those with managerial responsibility.

It is to be exhibited in the work area of responsibility which would typically be a mine site. This competency involves relevant legislation and codes of practice, and the maintenance of records, provision of information and training and the dealing with committees, statutory/legal agencies and site personnel.
Processes for consultation may include committees, consultation with statutory/legal agencies/site representatives, issue resolution procedures and participative/consultative procedures conducted by supervisory staff within the area of managerial responsibility.

Monitoring of activities may include review of written reports, performance appraisal or auditing procedures.

**Statutory/legal compliance may include but is not limited to:**
- common law
- dangerous goods
- development of training policies/programmes to aid compliance
- industrial relations
- industry licensing
- local government
- mines act
- navigation
- planning and assessment
- trade practices
- waterways
- weights and measures
- workers compensation/workcover.

**All actions are to be in accordance with all relevant statutory/legal requirements, particularly:**
- requirements for the maintenance of records for statutory/legal breaches
- provision of information and training
- regulations and codes of practice relating to statutory/legal compliance
- site representatives and committees
- issue resolution.

**Management operates within:**
- work schedules may include shift work and varying hours of duty
- environments ranging from simple to complex and diverse
- appropriate policies, guidelines and processes
- a level of autonomy which may range from limited to substantial
- quality and continuous improvement processes and standards
- business and performance plans
- ethical standards established by the organisation.
- productivity and profitability objectives and targets
- best practice and benchmarking principles and practices
- legislation, codes and practices
- resource parameters which may be defined or negotiated
- training and development principles and practices
- human resource policies and practices including interviewing, counselling, dispute settling and discipline
- financial accountability including profit and loss statements
- enterprise/industrial agreements/awards.
Management may assume varying roles including:
- leader
- coach
- facilitator
- mentor
- participant
- director
- trainer
- assessor.

Management will typically make decisions to:
- maintain statutory/legal compliance
- influence operational performance
- plan production schedules
- maximise production and minimise operating costs/risks and non-conformances
- analyse and review market/production predictions and costs
- manage projects and tasks.

Resources may include, but are not limited to:
- people
- finance
- equipment
- environment
- buildings/facilities
- technology
- information.

Negotiations may be with a variety of internal or external sources and be:
- formal or informal
- short term or ongoing
- multi-lingual and cross-cultural
- enterprise agreements
- legislation regulation compliance and include relative authorities, project managers, employees, contractors, customers and the community.

Consultation would typically include:
- regulatory authorities
- tenderers
- project managers
- contractors
- employees
- community
- customers
- suppliers.
This guideline is to assist the development of assessment instruments/tools to assess the competence of mining managers. At this level, mining managers must provide evidence of consistent achievement of this Unit's workplace outcomes.

1. **Context of Assessment**

   Leadership and Management competency development in the Industry is to be designed to optimise aided learning of the essential underpinning knowledge and mentored workplace development of application skills.

   The context of summative assessment should, to the maximum possible extent, be integrated with real work activities being completed by the candidate.

   Summative assessment of underpinning knowledge, to the extent it is required, and formative assessment of application skills may be conducted through simulations.

2. **Interdependent Assessment of Units**

   Within the Leadership and Management competency suite, there are a range of units which lend themselves to holistic assessment strategies.

   This unit covers four primary functions or outcomes being the development of evaluation measures and criteria, the evaluation of performance, the explanation of findings and the monitoring, adjusting and reporting performance. It therefore represents the review activity which may result in a range of other management and technical competencies being invoked.

   For these reasons, it would be normal for the assessment of this unit to be handled as an individual entity.

3. **Critical Aspects of Evidence.** The Industry has established that, for portability purposes, it is essential that competency in this unit reflects successful assessment in the critical aspects of behaviours and outcomes which require the candidate to:

   - determine and select evaluation measures and criteria for a significant mine function or activity
   - establish and manage qualitative evaluation activities
   - establish and manage quantitative evaluation activities
   - prepare formal evaluation reports
   - present evaluation results to stakeholders
   - manage the linking of evaluation outcomes with follow-up planning and management processes.
4. **Consistency of Performance.** Consistency of performance in this unit is aided by the standards of performance which are contained within State Legislation and by professional standards and practices established and observed by the Industry.

**UNDERPINNING KNOWLEDGE**

5. A knowledge of the listed topics/disciplines in sufficient scope and depth to enable the candidate to review, evaluate findings and initiate actions to enhance minesite's performance.

A knowledge of:

- advanced communication techniques
- strategic planning
- critical path analysis and planning methods and techniques
- corporate planning model and techniques
- corporate, group and individual goal selling techniques
- industrial awards/enterprise agreements
- occupational health and safety
- statutory and site rules, policies, procedures and regulations
- assertive techniques
- risk management processes and techniques.

6. **The ability to:**

- draw out and interpret the minesite's mission, objectives and policies in strategic planning
- identify the minesite's principal competitors, collaborators and other relevant organisations
- understand the different models of strategic planning and review and their relative advantages and disadvantages to the minesite, the work and available resources
- apply the principles of strategic planning and review in maintaining minesite performance
- monitor and review the principles and methods underpinning the evaluation of minesite performance
- understand the different models of minesite performance evaluation and their relative advantages and disadvantages to the minesite, the work and available resources
- understand the use of both quantitative and qualitative methods to evaluate minesite performance
- identify the types of information required to evaluate minesite performance and how to gather and validate such information
- develop appropriate measures and criteria to review minesite performance
- apply externally imposed indicators which are relevant to measuring the minesite’s performance
- use the existing sources of data and means of data gathering available to them
- optimise these sources of data to review minesite performance
- consult effectively with stakeholders on minesite performance
- identify possible reasons for failure in minesite performance
- analyse the reasons for success or failure in minesite performance
- identify the lessons which may be drawn from past minesite performance and their implications for future planning and continuous improvement activities
- present evaluation results effectively to a range of different audiences, both formally and informally.

**KEY COMPETENCIES**

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</table>
MNIL13A  Initiate, monitor and supervise contracts

Description: This unit addresses the planning, tender preparation, evaluation, contract negotiation and the monitoring and supervision of the contract. Its application is to ensure the establishment, implementation and maintenance of a business relationship between the mine site and external parties, together with the determination of the guidelines governing the conduct of the parties.

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<th>ELEMENT</th>
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<tbody>
<tr>
<td>L13.1</td>
<td>Scope, Plan and Prepare for Contracts.</td>
</tr>
<tr>
<td>L13.1.1</td>
<td>Areas/work for contracting are defined.</td>
</tr>
<tr>
<td>L13.1.2</td>
<td>Stages of contract preparation and implementation are defined and planned for.</td>
</tr>
<tr>
<td>L13.1.3</td>
<td>Site inspections are undertaken in accordance with enterprise requirements.</td>
</tr>
<tr>
<td>L13.1.4</td>
<td>Roles and responsibilities of all relevant individuals and groups are identified and specified.</td>
</tr>
<tr>
<td>L13.2</td>
<td>Prepare Specifications and Tenders.</td>
</tr>
<tr>
<td>L13.2.1</td>
<td>The work to be tendered is defined.</td>
</tr>
<tr>
<td>L13.2.2</td>
<td>Standards and conditions to be met by tenderers are established.</td>
</tr>
<tr>
<td>L13.2.3</td>
<td>The enterprises standard tender documentation is evaluated and modified to suit the tender.</td>
</tr>
<tr>
<td>L13.2.4</td>
<td>The procedural steps of the tender and consequential contract are defined.</td>
</tr>
<tr>
<td>L13.2.5</td>
<td>The tender document is written ready for distribution and advertising.</td>
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<tr>
<td>L13.3</td>
<td>Evaluate Tenders and Negotiate and Award Contract.</td>
</tr>
<tr>
<td>L13.3.1</td>
<td>Tenders received not in accordance with the conditions of tendering and with inaccurate information are identified.</td>
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<tr>
<td>L13.3.2</td>
<td>Tenders of unusually high and low rates are identified.</td>
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<tr>
<td>L13.3.3</td>
<td>A short list of appropriate tenderers is prepared.</td>
</tr>
<tr>
<td>L13.3.4</td>
<td>The financial position, past performance and insurance credentials of prospective contractors are assessed.</td>
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</tbody>
</table>
L13.3.5 Prospective contractors understanding the nature, volume of works and site conditions are identified.

L13.3.6 Current commitments of prospective contractors and their ability to complete works within practical time lines are evaluated.

L13.3.7 The occupational health and safety aspects of prospective contractors is evaluated.

L13.3.8 Details and any uncertainty of tenders are clarified and negotiated.

L13.3.9 An evaluation report of tenders with recommendation of a contractor is written.

L13.3.10 Successful and unsuccessful tenders are advised.

L13.4 Monitor and Supervise Contract Activities.

L13.4.1 Construction or installation sites are supervised.

L13.4.2 Materials procurement is coordinated.

L13.4.3 Contract conditions are evaluated in line with work progress.

L13.4.4 Contract variations are negotiated.

L13.4.5 Activities are monitored in accordance with OH&S, environmental legislative, enterprise and contractor requirements.

L13.5 Finalise Contract.

L13.5.1 Ensure outstanding claims are finalised.

L13.5.2 Repair work of defects/liabilities is monitored and finalised.

L13.5.3 Retention monies are released.

L13.5.4 Final certificate and other documentation is prepared and “signed off”.

RANGE OF VARIABLES

This competency standard is applicable for those with managerial responsibility.

It is to be exhibited in the work area of responsibility which would typically be a mine site.
This competency involves relevant legislation and codes of practice, and the maintenance of records, provision of information and training and the dealing with committees, statutory/legal agencies and site personnel.

Processes for consultation may include committees, consultation with statutory/legal agencies/site representatives, issue resolution procedures and participative/consultative procedures conducted by supervisory staff within the area of managerial responsibility.

Monitoring of activities may include review of written reports, performance appraisal or auditing procedures.

**Contract planning may include:**
- specifications
- schedules
- phasing
- services and facilities
- site inspection and requirements
- potential contractors.

**Site inspections may be conducted to:**
- confirm planning
- inspect preparation work
- assess compliance with specifications
- assess OH&S requirements and compliance.

**Evaluation of tenders or contracts may include:**
- schedules evaluation
- investigation of prospective contractors.

**Contracts and tenders may be:**
- from external applicants
- internal.
Documents may include:
- specifications
- briefs
- drawings
- pricing schedules
- instruments of agreement
- acceptance
- general conditions
- permits
- tenders
- plans of other utilities
- project plan.

Statutory/legal compliance may include but is not limited to:
- common law
- dangerous goods
- development of training policies/programmes to aid compliance
- industrial relations
- industry licensing
- local government
- mines act
- navigation
- planning and assessment
- trade practices
- waterways
- weights and measures
- workers compensation/workcover.

All actions are to be in accordance with all relevant statutory/legal requirements, particularly:
- requirements for the maintenance of records for statutory/legal breaches
- provision of information and training
- regulations and codes of practice relating to statutory/legal compliance
- site representatives and committees
- issue resolution.

Management operates within:
- work schedules may include shift work and varying hours of duty
- environments ranging from simple to complex and diverse
- appropriate policies, guidelines and processes
- a level of autonomy which may range from limited to substantial
- quality and continuous improvement processes and standards
- business and performance plans
- ethical standards established by the organisation
- productivity and profitability objectives and targets
- best practice and benchmarking principles and practices
- legislation, codes and practices
- resource parameters which may be defined or negotiated
• training and development principles and practices
• human resource policies and practices including interviewing, counselling, dispute settling and discipline
• financial accountability including profit and loss statements
• enterprise/industrial agreements/awards.

Management may assume varying roles including:
• leader
• coach
• facilitator
• mentor
• participant
• director
• trainer
• assessor.

Management will typically make decisions to:
• maintain statutory/legal compliance
• influence operational performance
• plan production schedules
• maximise production and minimise operating costs/risks and non-conformances
• analyse and review market/production predictions and costs
• manage projects and tasks.

Resources may include, but are not limited to:
• people
• finance
• equipment
• environment
• buildings/facilities
• technology
• information.

Negotiations may be with a variety of internal or external sources and be:
• formal or informal
• short term or ongoing
• multi-lingual and cross-cultural
• enterprise agreements
• legislation regulation compliance and include relative authorities, project managers, employees, contractors, customers and the community.

Consultation would typically include:
• regulatory authorities
• tenderers
• project managers
• contractors
• employees
• community
• customers
• suppliers.

**EVIDENCE GUIDE**

This guideline is to assist the development of assessment instruments/tools to assess the competence of mining managers. At this level, mining managers must provide evidence of consistent achievement of this Unit's workplace outcomes.

1. **Context of Assessment**

   Leadership and Management competency development in the Industry is to be designed to optimise aided learning of the essential underpinning knowledge and mentored workplace development of application skills.

   The context of summative assessment should, to the maximum possible extent, be integrated with real work activities being completed by the candidate.

   Summative assessment of underpinning knowledge, to the extent it is required, and formative assessment of application skills may be conducted through simulations.

2. **Interdependent Assessment of Units**

   Within the Leadership and Management competency suite, there are a range of units which lend themselves to holistic assessment strategies.

   This unit covers seven primary functions or outcomes being the scoping, planning and preparation for contracts, the preparation of specifications and tenders, the evaluation of tenders and the negotiation and awarding of the contract. It also encompasses the monitoring and supervision of the contract activities and the finalisation on completion of the contract. It therefore represents activities which may result in a range of other management and technical competencies being invoked.

   For these reasons, it would be normal for the assessment of this unit to be handled as an individual entity.

3. **Critical Aspects of Evidence.** The Industry has established that, for portability purposes, it is essential that competency in this unit reflects successful assessment in the critical aspects of behaviours and outcomes which require the candidate to:

   • prepare tenders
   • evaluate tenders
   • identify, assess, investigate and report departures from contractual requirements
   • monitor contract work procedures and progress
   • supervise contract activities
• finalise all contract activities.

4. **Consistency of Performance.** Consistency of performance in this unit is aided by the standards of performance which are contained within State legislation and by professional standards and practices established and observed by the Industry.

**UNDERPINNING KNOWLEDGE**

5. A knowledge of the listed topics/disciplines in sufficient scope and depth to enable the candidate to initiate, monitor and supervise contracts.

**A knowledge of:**

- enterprise tendering procedures
- enterprise contract procedures
- enterprise contract completion processes
- site inspection procedures
- investigation procedures
- evaluation and investigation requirements
- enterprise reporting procedures
- reporting requirements
- characteristics, technical capabilities and limitations of relevant materials
- material handling procedures
- relevant legislation
- OH&S and environmental legislation acts and procedures.

**UNDERPINNING SKILLS**

6. **The ability to:**

- contribute to planning processes
- monitor work progress
- order materials
- apply relevant legislation
- conduct investigations
- conduct site inspections
- prepare reports
- manage work effectively to achieve goals and results
- take a leading role in initiating actions and making decisions
- clearly identify what is required of others
- maintain a focus on objectives.

**KEY COMPETENCIES**

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**MNIL14A Establish and implement operational management plans**

Description: This unit covers the establishment and implementation of the operational plans. Its application involves establishing, managing and reviewing the management system, which supports continuous improvement across all the management elements required for a safe and efficient minesite.

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<td>L14.1  Satisfaction Levels of Internal/External Customers are Identified and Measured.</td>
<td>L14.1.1 All internal and external customers are identified and their requirements established.</td>
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<td></td>
<td>L14.1.2 Various formal and informal methods of measuring customer satisfaction are analysed.</td>
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<td>L14.1.3 Appropriate strategies and plans are developed to measure customer satisfaction levels.</td>
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<td>L14.1.4 Feedback from customers is communicated to all areas which may benefit from the information.</td>
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<tr>
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<td>L14.1.5 Trends in customer satisfaction levels are monitored to seek opportunities for improvement.</td>
</tr>
<tr>
<td>L14.2  Current Operational Processes are Measured for Quality and Efficiency.</td>
<td>L14.2.1 The key performance indicators (KPI's) influencing quality and efficiency of specified processes are identified.</td>
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<td></td>
<td>L14.2.2 Parameters of desired performance are identified and analysed.</td>
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<td>L14.2.3 Information on current practices and performance is used to identify opportunities for improvements in quality and productivity.</td>
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<td>L14.2.4 Recommendations are communicated so that improvement plans can be developed.</td>
</tr>
<tr>
<td>L14.3  Strategic Goals to Determine Operational Implications are Interpreted.</td>
<td>L14.3.1 The organisation's current strategic goals are known and understood.</td>
</tr>
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<td></td>
<td>L14.3.2 Strategic plans are interpreted to identify implications for own minesite.</td>
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<tr>
<td></td>
<td>L14.3.3 Risk analysis of strategic plans is undertaken to establish implications for own minesite.</td>
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</table>
| | L14.3.4 Consultation with appropriate people is
undertaken to ensure that the full implications of
the organisation's strategic goals on the minesite
are known.

L14.3.5 The strategic role of the minesite operations
within the total business system is communicated
to relevant personnel.

L14.4 Operational Plans to Enable the Achievement
and Improvement of Strategic Goals are Developed.

L14.4.1 Operations are analysed to identify
improvements required to achieve the strategic
goals.

L14.4.2 Communication processes are established to
report the progress and any problems occurring
with the implementation of operational plans.

L14.4.3 Action plans which detail minesite goals,
resource requirements, priorities and timelines
are formulated and deployed.

L14.4.4 When anticipated improvements are
unachievable, the causes are analysed and
appropriate adjustments made.

L14.4.5 The outcomes of improvements are reviewed and
used for further learning and continuous
improvement.

DEFINITION OF TERMS

For purposes of consistency, the following definitions have been applied in this standard.

consultation asking others for their views and involving them openly in
decision making

analysis the process of organising and interpreting information so that
conclusions can be drawn; methods may be formal and planned,
or informal and ad hoc

minesite objectives clearly defined and measurable results which the minesite
should achieve

policies rules which govern the way the minesite deals with key issues,
for example, health and safety, employment practices, customer
relations, environment and community issues

stakeholders all those who have an interest in, or may be affected by the
minesite and its activities; stakeholders may include, for
example, shareholders, directors, politicians, employees,
customers, supplier, local communities and many others
strategies plans which will guide the minesite in achieving its objectives

values those things the minesite believes in and seeks to realise in its work, for example, customer service, team working, quality or value for money

**RANGE OF VARIABLES**

This competency standard is applicable for those with managerial responsibility.

It is to be exhibited in the work area of responsibility which would typically be a minesite. This competency involves relevant legislation and codes of practice, and the maintenance of records, provision of information and training and the dealing with committees, statutory/legal agencies and site personnel.

Processes for consultation may include committees, consultation with statutory/legal agencies/site representatives, issue resolution procedures and participative/consultative procedures conducted by supervisory staff within the area of managerial responsibility.

Monitoring of activities may include review of written reports, performance appraisal or auditing procedures.

**Statutory/legal compliance may include but is not limited to:**
- common law
- dangerous goods
- development of training policies/programmes to aid compliance
- industrial relations
- industry licensing
- local government
- mines act
- navigation
- planning and assessment
- trade practices
- waterways
- weights and measures
- workers compensation/workcover.

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- regulations and codes of practice relating to statutory/legal compliance
- site representatives and committees
- issue resolution.

Management operates within:
- work schedules may include shift work and varying hours of duty
- environments ranging from simple to complex and diverse
- appropriate policies, guidelines and processes
- a level of autonomy which may range from limited to substantial
- quality and continuous improvement processes and standards
- business and performance plans
- ethical standards established by the organisation
- productivity and profitability objectives and targets
- best practice and benchmarking principles and practices
- legislation, codes and practices
- resource parameters which may be defined or negotiated
- training and development principles and practices
- human resource policies and practices including interviewing, counselling, dispute settling and discipline
- financial accountability including profit and loss statements
- enterprise/industrial agreements/awards.

Management may assume varying roles including:
- leader
- coach
- facilitator
- mentor
- participant
- director
- trainer
- assessor.

Management will typically make decisions to:
- maintain statutory/legal compliance
- influence operational performance
- plan production schedules
- maximise production and minimise operating costs/risks and non-conformances
- analyse and review market/production predictions and costs
- manage projects and tasks.

Resources may include, but are not limited to:
- people
- finance
- equipment
- environment
- buildings/facilities
- technology
- information.

Negotiations may be with a variety of internal or external sources and be:
• formal or informal
• short term or ongoing
• multi-lingual and cross-cultural
• enterprise agreements
• legislation regulation compliance and include relative authorities, project managers, employees, contractors, customers and the community.

**Consultation would typically include:**
• regulatory authorities
• tenderers
• project managers
• contractors
• employees
• community
• customers
• suppliers.

**EVIDENCE GUIDE**

This guideline is to assist the development of assessment instruments/tools to assess the competence of mining managers. At this level, mining managers must provide evidence of consistent achievement of this Unit's workplace outcomes.

1. **Context of Assessment**

   Leadership and Management competency development in the Industry is to be designed to optimise aided learning of the essential underpinning knowledge and mentored workplace development of application skills.

   The context of summative assessment should, to the maximum possible extent, be integrated with real work activities being completed by the candidate.

   Summative assessment of underpinning knowledge, to the extent it is required, and formative assessment of application skills may be conducted through simulations.

2. **Interdependent Assessment of Units**

   Within the Leadership and Management competency suite, there are a range of units which lend themselves to holistic assessment strategies.

   This unit covers five primary functions or outcomes being the identification, measuring, interpreting, monitoring and improving strategies and plans for the minesite's operation. It therefore represents activities which may result in a range of other management and technical competencies being invoked.
For these reasons, it would be normal for the assessment of this unit to be handled as an individual entity.

3. **Critical Aspects of Evidence.** The Industry has established that, for portability purposes, it is essential that competency in this unit reflects successful assessment in the critical aspects of behaviours and outcomes which require the candidate to:

- determine and select evaluation measures and criteria for a significant mine function or activity
- manage the linking of evaluation outcomes with follow-up planning and management processes
- develop effective values, policies, objectives and strategies
- gain the support of stakeholders
- determine and select evaluation measures and criteria for a significant mine function or activity
- consult and negotiate with customers and the community
- review strategies.

4. **Consistency of Performance.** Consistency of performance in this unit is aided by the standards of performance which are contained within State Legislation and by professional standards and practices established and observed by the Industry.

**UNDERPINNING KNOWLEDGE**

5. A knowledge of the listed topics/disciplines in sufficient scope and depth to enable the candidate to fully research and develop policies, values and strategies to underpin the establishment and implementation of operational management plans.

A knowledge of:

- strategic planning
- statutory and site rules, policies, procedures and regulations
- critical path analysis and planning methods and techniques
- corporate planning model and techniques
- risk management processes and techniques
- industrial awards/enterprise agreements
- occupational health and safety
- advanced negotiation techniques
- organisational change and development
- assertive techniques
- action planning methods

**UNDERPINNING SKILLS**

6. The ability to:

- display an understanding of how the different parts of the minesite and its environment fit together
- identify possible reasons for failure in minesite performance
- clearly relate your goals and actions to the strategic aims of the minesite
• work towards a clearly defined vision of the future
• clearly relate your goals and actions to the strategic aims of the minesite
• take opportunities when they arise to achieve the longer-term aims or needs of your minesite
• set objectives and create cultures which are ethical
• identify the interests of stakeholders and their implications for the minesite and individuals
• clearly identify and raise ethical concerns relevant to the minesite
• work towards the resolution of ethical dilemmas based on reasoned approaches
• communicate a vision which generates excitement, enthusiasm and commitment
• listen actively, ask questions, clarify points and rephrase others' statements to check mutual understanding
• adopt communication styles appropriate to listeners and situations, including selecting an appropriate time and place
• present yourself positively to others
• create and prepare strategies for influencing others
• understand the culture of the minesite and act to work within it or influence it
• establish information networks to search for and gather relevant information

• make best use of existing sources of information
• seek information from multiple sources
• break processes down into tasks and activities
• identify patterns or meaning from events and data which are not obviously related
• produce a variety of solutions before taking a decision
• take decisions which are realistic for the situation.

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MNIL15A  Manage customer service

Description: This unit covers the establishment, maintenance and evaluation of the organisations customer service requirements.

(This unit extends on from BSXFMI507A).

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<tr>
<td>L15.1 Plan to Meet Customer Requirements.</td>
<td>L15.1.1 Business plans and objectives are developed which clearly express the organisation's commitment with respect to quality, time and cost specifications agreed with customers.</td>
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<td>L15.1.2 The needs of customers are researched, understood, and assessed, and included in the planning process.</td>
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<td>L15.1.3 The customer service delivery plan is designed and developed from an analysis of all relevant technical and operational information.</td>
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<td>L15.1.4 Responsibilities for site specific functional and/or area aspects of customer service delivery are identified, recorded and allocated.</td>
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<td>L15.1.5 Information on the organisation's customer service requirements is provided and explained in a form, which is readily accessible to all employees.</td>
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<tr>
<td>L15.2 Ensure Delivery of Quality Products/Services.</td>
<td>L15.2.1 Products/services are delivered to customer specifications as outlined within the business plan.</td>
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<td>L15.2.2 Appropriate development and/or training is provided/arranged for those who have responsibility with the customer service delivery areas.</td>
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<td>L15.2.3 Individual/team performance consistently meets quality, safety, resource and delivery standards.</td>
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<td>L15.2.4 Advice and support is provided to assist colleagues to overcome difficulty in meeting customer service standards.</td>
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<td>L15.3 Monitor, Adjust and Report Customer Service.</td>
<td>L15.3.1 The organisation's systems and technology are used to monitor progress in achieving product/service targets and standards.</td>
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<td>L15.3.2 Customer feedback is sought and used to improve the provision of products/services.</td>
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<td>L15.3.3 Resources are used effectively and efficiently to provide quality products/services to customers.</td>
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<td>L15.3.4 Decisions to overcome problems with products/services are taken in consultation with designated individuals/groups.</td>
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<td>L15.3.5 Adjustments are made to products/services, and those who have a role in their planning and delivery are informed of changes.</td>
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<tr>
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<td>L15.3.6 Records, reports and recommendations are managed within the organisation's systems and processes.</td>
</tr>
</tbody>
</table>

**DEFINITION OF TERMS**

For purposes of consistency, the following definitions have been applied in this standard.

- **advice and support** providing direct advice, referring people to other sources of knowledge and expertise, giving hands-on assistance and providing suitable development activities
- **customers** someone who purchases/buys/utilises goods and/or services from another
- **objectives** clearly defined and measurable results which your minesite or program of work is scheduled to achieve
- **Responsibility** being accountable for the achievement of objectives

**RANGE OF VARIABLES**

Customers include any individual or organisation, within or outside Australia, who receives the product of the mine.

This unit describes generic customer service competencies applicable for those with managerial responsibilities.

It is to be exhibited in the work area of responsibility which would typically be a mine site.

This competency involves application of relevant customer service standards and codes of practice and provision of information and training.
Processes for consultation may include customer service review committees, consultation with customer service representatives, issue resolution procedures and participative/consultative procedures conducted by supervisory staff within the area of managerial responsibility.

Monitoring of activities may include review of written reports, performance appraisal or auditing procedures.

Relevant positions for implementing the customer service delivery system will include managers, supervisors and employees.

Management operates within:
- work schedules may include shift work and varying hours of duty
- environments ranging from simple to complex and diverse
- appropriate policies, guidelines and processes
- a level of autonomy which may range from limited to substantial.

All actions are to be in accordance with all relevant statutory/legal requirements, particularly:
- requirements for the maintenance of records for statutory/legal breaches
- provision of information and training
- regulations and codes of practice relating to statutory/legal compliance
- site representatives and committees
- issue resolution.

Statutory/legal compliance may include but is not limited to:
- common law
- dangerous goods
- development of training policies/programmes to aid compliance
- industrial relations
- industry licensing
- local government
- mines act
- navigation
- planning and assessment
- trade practices
- waterways
- weights and measures
- workers compensation/workcover.

Criteria which may require consideration includes:
- business and performance plans
- ethical standards established by the organisation
- productivity and profitability objectives and targets
- best practice and benchmarking principles and practices
- legislation, codes and practices
- resource parameters which may be defined or negotiated
- training and development principles and practices
• human resource policies and practices including interviewing, counselling, dispute settling and discipline
• financial accountability including profit and loss statements
• enterprise/industrial agreements/awards.

Management may assume varying roles including:
• leader
• coach
• facilitator
• mentor
• participant
• director
• trainer
• assessor.

Management will typically make decisions to:
• maintain statutory/legal compliance
• influence operational performance
• plan production schedules
• maximise production and minimise operating costs/risks and non-conformances
• analyse and review market/production predictions and costs
• manage projects and tasks.

Resources may include, but are not limited to:
• people
• finance
• equipment
• environment
• buildings/facilities
• technology
• information.

Negotiations may be with a variety of internal or external sources and be:
• formal or informal
• short-term or ongoing
• multi-lingual and cross-cultural
• enterprise agreements
• legislation regulation compliance and include relative authorities, project managers, employees, contractors, customers and the community.

Consultation would typically include:
• regulatory authorities
• tenderers
• project managers
• contractors
• employees
• community
• customers
• suppliers.
This guideline is to assist the development of assessment instruments/tools to assess the competence of mining managers. At this level, mining managers must provide evidence of consistent achievement of this Unit's workplace outcomes.

1. **Context of Assessment**

   Leadership and Management competency development in the Industry is to be designed to optimise aided learning of the essential underpinning knowledge and mentored workplace development of application skills.

   The context of summative assessment should, to the maximum possible extent, be integrated with real work activities being completed by the candidate.

   Summative assessment of underpinning knowledge, to the extent it is required, and formative assessment of application skills may be conducted through simulations.

2. **Interdependent Assessment of Units**

   Within the Leadership and Management competency suite, there are a range of units which lend themselves to holistic assessment strategies.

   This unit covers three primary functions or outcomes being the planning to meet customer requirements, ensuring delivery of quality products/services and the monitoring, adjustment and reporting of customer service. It therefore represents activities which may result in a range of other management and technical competencies being invoked.

   For these reasons, it would be normal for the assessment of this unit to be handled as an individual entity.

3. **Critical Aspects of Evidence.** The Industry has established that, for portability purposes, it is essential that competency in this unit reflects successful assessment in the critical aspects of behaviours and outcomes which require the candidate to:

   - ensure that legislation and standards are met in providing customer service
   - develop and maintain effective communication with customers
   - seek customer feedback and acts on constructive advice
   - manage products/services within budget constraints
   - make decisions within responsibility and authority in a diverse and complex workplace
   - research, acquire and use information appropriate to work responsibility
   - monitor/introduce ways to improve products/services
   - use effective consultative processes
   - treat people openly and fairly
   - prepare and negotiate recommendations to improve customer service
   - use information management systems.

4. **Consistency of Performance.** Consistency of performance in this unit is aided by the standards of performance which are contained within State Legislation and by professional standards and practices established and observed by the Industry.
UNDERPINNING KNOWLEDGE

5. A knowledge of the listed topics/disciplines in sufficient scope and depth to enable the candidate to delegate responsibility and authority to subordinates.

A knowledge of:

- action planning methods
- business planning
- customer survey techniques
- duty of care
- hierarchy of control
- human resource management
- market research techniques
- physical distribution management techniques
- risk management processes and techniques
- statutory and site rules, policies, procedures and regulations
- strategic planning
- training design and management.

UNDERPINNING SKILLS

6. The ability to:

- access, interpret and apply customer service policies and codes of practice
- apply planning principles
- apply the hierarchy of control
- manage customer service training
- communicate customer service matters
- evaluate and investigate customer service procedures
- improve customer service systems and procedures
- take a leading role in initiating actions and making decisions
- clearly identify what is required of others
- manage work effectively to achieve goals and results
- monitor and introduce ways for people to develop knowledge and skills
- encourage colleagues to share their knowledge and skills
- use coaching and mentoring to assist knowledge and skill formation
- take personal responsibility for making things happen
- keep others informed about plans and progress
- invite others to contribute to planning and organising work
- set objectives which are both achievable and challenging
- check individuals' commitment to a specific course of action
- identify and resolve causes of conflict or resistance.

KEY COMPETENCIES

<table>
<thead>
<tr>
<th>Key Competency</th>
<th>Level</th>
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<tbody>
<tr>
<td></td>
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<td>Activity</td>
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<td>----------------------------------------------</td>
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<tr>
<td>Collecting, analysing &amp; organising information</td>
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<tr>
<td>Communicating ideas &amp; information</td>
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<td>Solving problems</td>
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<td>Using technology</td>
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</table>
**MNIL17A  Conduct business negotiations**

Description: This unit covers the conduct of the minesite's business negotiations. Its application involves reviewing the minesite's business objectives and strategies to maximise results.

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<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>L17.1</td>
<td>Establish and Confirm the Minesite's Business Objective(s).</td>
</tr>
<tr>
<td>L17.1.1</td>
<td>Business opportunities available to the minesite are identified and targeted.</td>
</tr>
<tr>
<td></td>
<td>Discussions with stakeholders are facilitated to provide strategies and ideas to meet outcome(s).</td>
</tr>
<tr>
<td></td>
<td>Information is analysed to allow for assessment of the short-term and long-term position of the business.</td>
</tr>
<tr>
<td></td>
<td>Agreed decisions and recommendations fall within the minesite's business objectives and are appropriate to desired outcomes.</td>
</tr>
<tr>
<td>L17.2</td>
<td>Conduct Business Negotiations.</td>
</tr>
<tr>
<td>L17.2.1</td>
<td>Key stakeholders who can assist achievement of the outcome are consulted and/or lobbied.</td>
</tr>
<tr>
<td></td>
<td>Preparation for the meeting is sufficient to enable effective business negotiation and to achieve desired outcome(s).</td>
</tr>
<tr>
<td></td>
<td>Contributions to the negotiations are clear, concise and relevant which help to achieve business objective.</td>
</tr>
<tr>
<td></td>
<td>Appropriate and accurate records and key outcomes of negotiations are documented/recorded.</td>
</tr>
<tr>
<td>L17.3</td>
<td>Evaluate Negotiation Outcomes.</td>
</tr>
<tr>
<td>L17.3.1</td>
<td>Outcomes of negotiations are evaluated.</td>
</tr>
<tr>
<td></td>
<td>Outcomes of negotiations are referred to stakeholders who assisted in preparation of strategies.</td>
</tr>
<tr>
<td></td>
<td>Outcomes of negotiations are reviewed for improvement.</td>
</tr>
<tr>
<td></td>
<td>Outcomes and decisions are followed up and circulated as necessary.</td>
</tr>
</tbody>
</table>
DEFINITION OF TERMS

For purposes of consistency, the following definitions have been applied in this standard.

consultation
seeking people's views on particular issues

information to allow people to contribute effectively
date, venue, time of meeting, directions as to how to reach the venue, purpose and objectives, agenda and briefing/discussion papers

outcomes
clear results which are to be achieved as a result of the meeting

summaries
briefly going over the main discussion points and areas of agreement and disagreement to help people come to a collective decision.

RANGE OF VARIABLES

This competency standard is applicable for those with managerial responsibility.

It is to be exhibited in the work area of responsibility which would typically be a mine site. The competency involves relevant legislation and codes of practice, and the maintenance of records, provision of information and training and the dealing with committees, statutory/legal agencies and site personnel.

Processes for consultation may include committees, consultation with statutory/legal, industrial representatives, agencies/site representatives, issue resolution procedures and participative/consultative procedures conducted by supervisory staff within the area of managerial responsibility.

Monitoring of activities may include review of written reports, performance appraisal or auditing procedures.

Statutory/legal compliance may include but is not limited to:
- common law
- dangerous goods
- development of training policies/programmes to aid compliance
- industrial relations
- industry licensing
- local government
- mines act
- navigation
- planning and assessment
- trade practices
- waterways
- weights and measures
- workers compensation/workcover.
All actions are to be in accordance with all relevant statutory/legal requirements, particularly:
- requirements for the maintenance of records for statutory/legal breaches
- provision of information and training
- regulations and codes of practice relating to statutory/legal compliance
- site representatives and committees
- issue resolution.

Management operates within:
- work schedules may include shift work and varying hours of duty
- environments ranging from simple to complex and diverse
- appropriate policies, guidelines and processes
- a level of autonomy which may range from limited to substantial
- quality and continuous improvement processes and standards
- business and performance plans
- ethical standards established by the organisation
- productivity and profitability objectives and targets
- best practice and benchmarking principles and practices
- legislation, codes and practices
- resource parameters which may be defined or negotiated
- training and development principles and practices
- human resource policies and practices including interviewing, counselling, dispute settling and discipline
- financial accountability including profit and loss statements
- enterprise/industrial agreements/awards.

Management may assume varying roles including:
- leader
- coach
- facilitator
- mentor
- participant
- director
- trainer
- assessor.

Management will typically make decisions to:
- maintain statutory/legal compliance
- influence operational performance
- plan production schedules
- maximise production and minimise operating costs/risks and non-conformances
- analyse and review market/production predictions and costs
- manage projects and tasks.

Resources may include, but are not limited to:
- people
- finance
- equipment
- environment
• buildings/facilities
• technology
• information.

Negotiations may be with a variety of internal or external sources and be:
• formal or informal
• short term or ongoing
• multi-lingual and cross-cultural
• enterprise agreements
• legislation regulation compliance and include relative authorities, project managers, employees, contractors, customers and the community.

Consultation would typically include:
• regulatory authorities
• tenderers
• project managers
• contractors
• employees
• community
• customers
• suppliers.

**EVIDENCE GUIDE**

This guideline is to assist the development of assessment instruments/tools to assess the competence of mine managers. At this level, mining managers must provide evidence of consistent achievement of this Unit's workplace outcomes.

1. **Context of Assessment**

   Leadership and Management competency development in the Industry is to be designed to optimise aided learning of the essential underpinning knowledge and mentored workplace development of application skills.

   The context of summative assessment should, to the maximum possible extent, be integrated with real work activities being completed by the candidate.

   The context of summative assessment should, to the maximum possible extent, be integrated with real work activities being completed by the candidate.

   Summative assessment of underpinning knowledge, to the extent it is required, and formative assessment of application skills may be conducted through simulations.

2. **Interdependent Assessment of Units**

   Within the Leadership and Management competency suite, there are a range of units which lend themselves to holistic assessment strategies.
This unit covers three primary functions or outcomes, being the establishment of the minesite's business objectives, the conduct of negotiations and the processing of the outcomes of negotiations. It therefore represents an activity which may result in a range of other management and technical competencies being invoked.

For these reasons, it would be normal for the assessment of this unit to be handled as an individual entity.

3. **Critical Aspects of Evidence.** The Industry has established that, for portability purposes, it is essential that competency in this unit reflects successful assessment in the critical aspects of behaviours and outcomes which require the candidate to:

- effectively analyse the external environment for business opportunities
- develop their negotiation strategy
- plan and prepare for business negotiations
- identify possible outcomes
- consult and lobby key stakeholders
- develop business strategies
- participate in and influence negotiations
- evaluate the outcomes
- promulgate the outcomes.

4. **Consistency of Performance.** Consistency of performance in this unit is aided by the standards of performance within statutory and site rules, policies, procedures and regulations and by professional standards and practices established and observed by the Industry.

**UNDERPINNING KNOWLEDGE**

5. A knowledge of the listed topics/disciplines in sufficient scope and depth to enable the candidate to manage and enhance positive outcomes in the conduct of business negotiations.

**A knowledge of:**

- advanced written and oral communication methods
- organisational goals and objectives
- subject/product knowledge
- assertive techniques
- advanced negotiation skills
- receptive listening skills
- statutory and site rules, policies, procedures and regulations
- mine operating procedures
- risk management processes and techniques
- risk control and management systems
- reporting and recording procedures
- access, evaluate and apply data from organisational systems
- action planning methods.
UNDERPINNING SKILLS

6. The ability to:

- take a leading role in initiating action and making decisions
- establish the rules of procedure
- adopt communications styles appropriate to listeners and situations, including selecting an appropriate time and place
- identify the information needs of participants
- listen actively, ask questions, clarify points and rephrase others' statements to check mutual understanding
- prioritise objectives and schedule work to make best use of time and resources
- modify communications in response to feedback from participants
- actively encourage the free exchange of information
- produce a variety of solutions before taking a decision
- show respect for the views and actions of others
- encourage participants to ask questions or rephrase statements to clarify their understanding
- encourage decisions which are realistic for the situation
- produce own ideas from experience and practice
- reconcile and make use of a variety of perspectives when making sense of a situation
- actively build relationships with others
- present yourself positively to others.

KEY COMPETENCIES

<table>
<thead>
<tr>
<th>Key Competency</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collecting, analysing &amp; organising information</td>
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</table>
Technical Management Units of Competency

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<th>Description</th>
<th>Page</th>
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<td>Establish the mine statutory/legal compliance system</td>
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<td>MNIC02A</td>
<td>Establish the mine risk assessment and control system</td>
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<tr>
<td>MNIC03A</td>
<td>Establish mine infrastructure and plant systems</td>
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<tr>
<td>MNIC04A</td>
<td>Establish mine services systems</td>
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<td>MNIC05A</td>
<td>Establish plant, equipment and infrastructure maintenance systems</td>
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<td>Establish the mine water management system</td>
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<td>MNIC07A</td>
<td>Establish the stockpile management system</td>
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<td>MNIC08A</td>
<td>Establish waste and by product management system</td>
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<td>MNIC09A</td>
<td>Establish and manage the mine occupational health and safety system</td>
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<td>Establish a blasting system</td>
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<td>Establish mine closure management systems</td>
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<td>MNIS01A</td>
<td>Establish ground control and slope stability systems</td>
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</tr>
<tr>
<td>MNIS02A</td>
<td>Establish surface product haulage and transport systems</td>
<td>425</td>
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<tr>
<td>MNIU01A</td>
<td>Establish ground control and stable mining systems</td>
<td>433</td>
</tr>
<tr>
<td>MNIU02A</td>
<td>Establish the ventilation management system</td>
<td>443</td>
</tr>
<tr>
<td>MNIU03A</td>
<td>Establish underground product haulage and transport systems</td>
<td>457</td>
</tr>
</tbody>
</table>
**MNIC01A Establish the mine statutory/legal compliance system**

**Description:** This Unit covers the use of appropriate measures and criteria to establish the mine statutory/legal compliance system.

Its application provides for the establishment, implementation, maintenance and evaluation of the organisation's statutory/legal compliance system.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| C1.1 **Develop, Implement and Maintain the Framework for Compliance to Statutory/Legal Systems in the Area of Responsibility.** | C1.1.1 Policies are developed which clearly express the organisation's commitment with respect to statutory/legal compliance within the area of managerial responsibility and how relevant legislation will be implemented, consistent with overall organisational policies.  
C1.1.2 Responsibilities and duties which will allow implementation and integration of the statutory/legal systems are clearly defined, allocated and included in job descriptions and duty statements for all relevant positions.  
C1.1.3 Financial and human resources for the operation of statutory/legal systems are identified, sought and/or provided in a timely and consistent manner.  
C1.1.4 Information on statutory/legal systems and procedures for the area of responsibility is provided and explained in a form, which is readily accessible to employees. |
| C1.2 **Develop, Implement and Maintain Participative Arrangements for the Management of Statutory/Legal Compliance.** | C1.2.1 Appropriate consultative processes are established and maintained in consultation with employees and their representatives in accordance with relevant legislation and consistent with the organisation's overall process for consultation.  
C1.2.2 Issues raised through participation and consultation are dealt with and resolved promptly and effectively in accordance with procedures for issue resolution.  
C1.2.3 Information about the outcomes of participation and consultation is provided in a manner accessible to employees. |
<table>
<thead>
<tr>
<th>C1.3</th>
<th>Implement and Monitor the Organisation's Procedures for Identifying Potential and Existing Non-Compliance.</th>
<th>C1.3.1</th>
<th>Existing and potential non-compliance in the work area are identified and reported so that assessment and treatment procedures can be applied.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1.4</td>
<td>Implement and Monitor the Organisation's Procedures for Treating Compliance.</td>
<td>C1.4.1</td>
<td>Work procedures to treat compliance are implemented and adherence to them by the work group is monitored in accordance with workplace procedures.</td>
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<td>C1.4.2</td>
<td>Existing compliance treatment measures are monitored and results reported regularly in accordance with workplace procedures.</td>
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<tr>
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<td>C1.4.3</td>
<td>Inadequacies in existing compliance measures are identified and reported to designated personnel.</td>
</tr>
<tr>
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<td></td>
<td>C1.4.4</td>
<td>Inadequacies in resource allocation for implementation of compliance measures are identified and reported to designated personnel.</td>
</tr>
<tr>
<td>C1.5</td>
<td>Develop, Implement and Maintain Procedures for Controlling Statutory/Legal Compliance</td>
<td>C1.5.1</td>
<td>Measures to avoid non-compliance are developed and implemented in relevant legislation, codes of practice and trends identified from the organisation's records system.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C1.5.2</td>
<td>When measures, which treat non-compliance at its source, are not immediately practicable, interim solutions are implemented until a permanent control measure is developed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C1.5.3</td>
<td>A procedure for ongoing treatment of compliance is developed and integrated within general systems of work and procedures.</td>
</tr>
<tr>
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<td></td>
<td>C1.5.4</td>
<td>Activities are monitored to ensure that the compliance treatment procedure is adopted effectively throughout the area of managerial responsibility.</td>
</tr>
<tr>
<td>C1.5</td>
<td>Develop, Implement and Maintain Procedures for Controlling Statutory/Legal Compliance (continued).</td>
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<tr>
<td>C1.6</td>
<td>Develop, Implement and Maintain Organisational Procedures for Statutory/Legal Compliance.</td>
<td>C1.6.1</td>
<td>Potential non-compliant events are correctly identified.</td>
</tr>
<tr>
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<td>C1.6.2</td>
<td>Procedures, which would treat compliance and legislative requirements as a minimum, are developed in consultation with appropriate statutory/legal bodies.</td>
</tr>
</tbody>
</table>
C1.6.3 Appropriate information and training is provided to all employees to enable implementation of the correct procedures in all relevant circumstances.

C1.7 Develop, Implement and Maintain a Statutory/Legal Compliance Records System.

C1.7.1 A system for keeping statutory/legal compliance records is established and monitored to allow identification of patterns of non-compliance within the area of managerial responsibility.

C1.8 Evaluate the Organisation's Statutory/Legal Compliance System and Related Policies, Procedures and Programs.

C1.8.1 The effectiveness of the statutory/legal compliance system and related policies, procedures and programs is assessed according to the organisation's aims.

C1.8.2 Improvements to the statutory/legal compliance system are developed and implemented to ensure more effective achievement of the organisation's aims.

C1.8.3 Compliance with legislation and codes of practice is assessed to ensure that legal standards are maintained as a minimum.

DEFINITION OF TERMS

For the purposes of this standard, the definitions below apply:

audit a systematic examination against defined criteria to determine whether activities and related results conform to planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve the organisation's policy and objectives.

risk the combination of the frequency, or probability of occurrence, and consequence of a specified hazardous event.

hazard a source or a situation with a potential for harm in terms of human injury or ill-health, damage to property, damage to the environment, or a combination of these.

standard operating procedures (SOP) are also known as safe working procedures, safe operating procedures and standard working procedures.

RANGE OF VARIABLES

This competency standard is applicable for those with managerial responsibilities. This may be as a Senior/Specialist Manager or as an owner of a business. These competencies may be applicable in combination with other industry, occupation or workplace specific competencies.
It is to be exhibited in the work area of managerial responsibility which might be an entire enterprise or department of an enterprise.

The competency involves application of relevant legislation and codes of practice, and the maintenance of records, provision of information and dealing with committees, statutory/legal agencies, organisational representatives.

Processes for consultation may include committees, consultation with statutory/legal agencies/site representatives, issue resolution procedures and participative/consultative procedures conducted by supervisory staff within the area of managerial responsibility.

Monitoring of activities may include review of written reports, performance appraisal or auditing procedures.

**Statutory/legal compliance may include but is not limited to:**
- common law
- dangerous goods
- development of training policies/programmes to aid compliance
- health and safety
- industrial relations
- industry licensing
- local government
- mines act
- navigation
- planning and assessment
- trade practices
- waterways
- weights and measures
- workers compensation/workcover.

**In accordance with all relevant statutory/legal requirements, particularly:**
- requirements for the maintenance of records for statutory/legal breaches
- provision of information and training
- regulations and codes of practice relating to statutory/legal compliance
- site representatives and committees
- issue resolution.

**Management operates within:**
- a level of autonomy which may range from limited to substantial
- appropriate policies, guidelines and processes
- best practice and benchmarking principles and practices
- business and performance plans
- enterprise/industrial agreements/awards
- environments ranging from simple to complex and diverse
- ethical standards established by the organisation
- financial accountability including profit and loss statements
human resource policies and practices including interviewing, counselling, dispute settling and discipline
legislation, codes and practices
productivity and profitability objectives and targets
quality and continuous improvement processes and standards
resource parameters which may be defined or negotiated
training and development principles and practices
work schedules which may include shift work and varying hours of duty.

Resources may include, but are not limited to:
- people
- finance
- equipment
- environment
- buildings/facilities
- technology
- information.

Negotiations may be with a variety of internal or external sources and be:
- formal or informal
- short term or ongoing
- multi-lingual and cross-cultural
- enterprise agreements
- legislation regulation compliance

and include relative authorities, project managers, employees, contractors, customers and the community.

Consultation would typically include:
- regulatory authorities
- tenderers
- project managers
- contractors
- employees
- community
- customers
- suppliers.

**EVIDENCE GUIDE**

This guideline is to assist the development of assessment instruments/tools to assess the competence of mining managers. At this level, mining managers must provide evidence of consistent achievement of this Unit's workplace outcomes.

1. **Context of Assessment**
The ultimate competency outcome is for the candidate to be able to establish and manage the mine statutory/legal compliance systems and, in so doing, to satisfy the performance criteria and underpinning knowledge requirements agreed by the industry in this Competency Unit.

Statutory/legal compliance system management circumstances and requirements will differ markedly between mine sites. Therefore, there are limitations on the extent to which the practical establishment of the compliance system may be assessed in the workplace. To bridge this potential gap and to ensure the candidate is able to apply the extensive theory to a working situation, assessment is likely to include formal simulation exercises.

The assessment system for this competency is to cover the following:

A. Theory and knowledge underpinning the competency which is a mandatory requirement

B. Application of theory to a generic practical situation/simulation

OR

C. Practical establishment of a mine statutory/legal compliance system.

Technical/Safety Management competency development in the Industry is to be designed to optimise aided learning of the essential underpinning knowledge and mentored workplace development of application skills.

Guidelines will be in line with statutory/legal requirements, enterprise specific policies and procedures and codes of practice.

2. Interdependent Assessment of Units

Within the Technical Management competency suite, there is a range of units which lend themselves to holistic assessment strategies; however, this unit is the starting point for many of them. For this reason, it would be normal for the assessment of this unit to be handled as an individual entity.

This unit covers a range of primary functions or outcomes being the development and implementation of the compliance framework, participative arrangements for the system's management, procedures for identifying non-compliance and procedures for treating, controlling, maintaining, recording and evaluating compliance. It therefore represents an integrated activity which may result in a range of other management and technical competencies being invoked.

3. Critical Aspects of Evidence. The Industry has established that, for portability purposes, it is essential that competency in this unit reflects successful assessment in the critical aspects of behaviours and outcomes which require the candidate to:

- develop, implement and maintain the framework for compliance to statutory/legal systems
• develop, implement and maintain participative arrangements for the management of statutory/legal compliance
• develop, implement and maintain procedures for controlling statutory/legal compliance
• develop, implement and maintain organisational procedures for statutory/legal compliance
• develop, implement and maintain procedures for identifying and assessing non-compliance
• develop, implement and maintain a statutory/legal compliance records system
• evaluate the organisation's statutory/legal compliance system and related policies, procedures and programs.

4. **Consistency of Performance.** Consistency of performance in this unit is aided by the standards of performance within statutory and site rules, policies, procedures and regulations and by professional standards and practices established and observed by the Industry.

5. **A knowledge of the listed topics/disciplines in sufficient scope and depth to enable the candidate to manage and enhance positive outcomes in the development and establishment of the mine's statutory/legal compliance system.**

A knowledge of:

• access, evaluate and apply data from organisational systems
• action planning methods
• advanced negotiation skills
• advanced written and oral communication methods
• company policy
• environmental management
• health and safety rules, policies, procedures and regulations
• human resource management
• mine operating procedures
• organisational goals and objectives
• receptive listening skills
• reporting and recording procedures
• risk control and management systems
• risk management processes and techniques
• statutory and site rules, policies, procedures and regulations
• statutory/legal control
• work procedure/instruction writing.

**UNDERPINNING SKILLS**

6. **The ability to:**

• develop and maintain risk management procedures and policies.
• read, interpret, apply and communicate technical information, rules, procedures, regulations etc.
• provide leadership and guidance for group activities
• communicate effectively in the workplace
• facilitate and document risk control planning
• maintain relevant records and documents
• monitor and decide on changes to process
• explain complex information to superiors/subordinates
• provide coaching and mentoring support
• read, interpret and apply legislation
• adopt communications styles appropriate to listeners and situations, including selecting an appropriate time and place
• take a leading role in initiating action and making decisions
• listen actively, ask questions, clarify points and rephrase others' statements to check mutual understanding

• show sensitivity to the needs and feelings of others
• actively encourage the free exchange of information
• produce a variety of solutions before taking a decision
• show respect for the views and actions of others
• produce own ideas from experience and practice
• present yourself positively to others.

## KEY COMPETENCIES

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<tr>
<td>Using technology</td>
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</table>
# MNIC02A Establish the mine risk assessment and control system

**Description:**
This unit covers the use of appropriate measures and criteria to establish the mine risk assessment and control system. Its application provides for the actions taken to lead, manage and coordinate the risk assessment and control system for a site/area.

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<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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</thead>
<tbody>
<tr>
<td>C2.1 Establish the Risk Assessment and Control System.</td>
<td>C2.1.1 Site/enterprise policy and strategic risk assessment and control system goals and approaches are identified and documented.</td>
</tr>
<tr>
<td></td>
<td>C2.1.2 Structures and frameworks for the management and implementation of the control system are established.</td>
</tr>
<tr>
<td></td>
<td>C2.1.3 Responsibility for site specific functional and/or area aspects of the control system are identified, recorded and allocated.</td>
</tr>
<tr>
<td>C2.2 Establish Processes to Support the System.</td>
<td>C2.2.1 Detailed processes covering risk assessment, risk analysis and risk control are developed, documented and communicated.</td>
</tr>
<tr>
<td></td>
<td>C2.2.2 Appropriate development and/or training is provided/arranged for those who have responsibilities within the control system.</td>
</tr>
<tr>
<td></td>
<td>C2.2.3 Information sources required to support the control system are identified, obtained, maintained and made available to those who implement the control processes.</td>
</tr>
<tr>
<td></td>
<td>C2.2.4 Information on known and intended process changes and enhancements is made available to those responsible for implementing control processes.</td>
</tr>
<tr>
<td>C2.2 Establish Processes to Support the System. (Continued)</td>
<td>C2.2.5 Site criteria for assessing the acceptability of risks is determined and made available to those responsible for implementing control processes.</td>
</tr>
<tr>
<td></td>
<td>C2.2.6 Expert advice is obtained and provided as necessary to those responsible for</td>
</tr>
</tbody>
</table>
C2.3 Implement the Risk Assessment and Control System.

C2.3.1 System coverage of the entire work environment is planned, scheduled and documented.

C2.3.2 System activities and achievement targets are monitored and resources provided/focussed to ensure the work plan is satisfied.

C2.3.3 Support and encouragement is provided to those responsible for the detailed system activities.

C2.3.4 System work plan is reviewed and updated periodically and when changing circumstances are anticipated/occur.

C2.4 Audit Risk Management Processes.

C2.4.1 Risk management processes, including Standard Operating Procedures and implementation processes are formally audited to ensure compliance and effectiveness.

C2.4.2 Changed requirements disclosed during audits are responded to in a systematic and timely manner.

C2.4.3 Risk management documentation covering the reasons for and changes made are completed and retained to site and relevant statutory requirements.

C2.5 Complete Records and Reports.

C2.5.1 All risk management and control documentation and reports are produced, processed and maintained as specified by legislative and site requirements.

DEFINITION OF TERMS

For the purpose of this standard, the definitions below apply (AS/NZS 4804: 2000, AS 4801:2000):

**audit**

a systematic examination against defined criteria to determine whether activities and related results conform to planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve the organisation's policy and objectives.

**consequence**

the outcome of an event or situation expressed qualitatively or quantitatively, being a loss, injury, disadvantage or gain.

**cost**

of activities, both direct and indirect, involving any negative impact, including money, time, labour, disruption, goodwill, political and intangible losses.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>frequency</td>
<td>a measure of likelihood expressed as the number of occurrences of an event in a given time.</td>
</tr>
<tr>
<td>hazard</td>
<td>a source or a situation with a potential for harm in terms of human injury or ill-health, damage to property, damage to the environment, or a combination of these.</td>
</tr>
<tr>
<td>hazard identification</td>
<td>the process of recognising that a hazard exists and defining its characteristics.</td>
</tr>
<tr>
<td>likelihood</td>
<td>used as a qualitative description of probability and frequency.</td>
</tr>
<tr>
<td>loss</td>
<td>any negative consequence, financial or otherwise.</td>
</tr>
<tr>
<td>monitor</td>
<td>to check, supervise, observe critically, or record the progress of an activity, action or system on a regular basis in order to identify change.</td>
</tr>
<tr>
<td>probability</td>
<td>the likelihood of a specific outcome, measured by the ratio of specific outcomes to the total number of possible outcomes. Probability is expressed as a number between 0 and 1, with 0 indicating an impossible outcome and 1 indicating an outcome is certain.</td>
</tr>
<tr>
<td>risk</td>
<td>the combination of the frequency, or probability of occurrence, and consequence of a specified hazardous event.</td>
</tr>
<tr>
<td>risk acceptance</td>
<td>an informed decision to accept the likelihood and the consequences of a particular risk.</td>
</tr>
<tr>
<td>risk analysis</td>
<td>a systematic use of available information to determine how often specified events may occur and the magnitude of their likely consequences.</td>
</tr>
<tr>
<td>risk assessment</td>
<td>the overall process of estimating the magnitude of risk and deciding what actions will be taken.</td>
</tr>
<tr>
<td>risk avoidance</td>
<td>an informed decision not to become involved in a risk situation.</td>
</tr>
<tr>
<td>risk control</td>
<td>the process of elimination or minimisation of risks.</td>
</tr>
<tr>
<td>risk identification</td>
<td>the process of determining what can happen, why and how.</td>
</tr>
<tr>
<td>risk management</td>
<td>the systematic application of management policies, procedures and practices to the tasks of identifying, analysing, assessing, treating and monitoring risk.</td>
</tr>
</tbody>
</table>
Parameters of the risk assessment and control system may include objectives, system boundaries, hazard types and consequences, methods, team processes, timings, venue/locations and consultation processes.

Risk assessment and control systems and measures include those focused on personal safety (eg. personal protective equipment, medical standards, drug and alcohol, stress management and evacuation), equipment and machinery isolation, protection and guarding, hazard identification and monitoring, chemical safety, fire safety and other potential emergency related circumstances.

The organisation's internal policy, goals and/or objectives must determine the criteria for acceptable risk.

Risks in the workplace may involve equipment, methods/plans, competencies and/or the work environment.

Controls for risks should be considered using option types in sequence from eliminating the hazard, substitution, engineering controls, administrative controls (procedures, etc.) and, finally PPE.

Records and reports for risk assessment may include a full report including Objective, Method, Results and Recommendations, the Risk Assessment Forms, Action Planning documents, etc.

Site policy, objectives, rules and procedures will vary from site to site.

**Statutory/legal compliance may include but is not limited to:**
- common law
- dangerous goods
- development of training policies/programmes to aid compliance
- industrial relations
- local government
- minerals and extractive industry licensing
- mines act
- navigation
- planning and assessment
- trade practices
- waterways
- weights and measures
- workers compensation/workcover.

**In accordance with all relevant statutory/legal requirements, particularly:**
- requirements for the maintenance of records for statutory/legal breaches
- provision of information and training
- regulations and codes of practice relating to statutory/legal compliance
- site representatives and committees
- issue resolution.

**Management operates within:**
- a level of autonomy which may range from limited to substantial
- appropriate policies, guidelines and processes
- best practice and benchmarking principles and practices
• business and performance plans
• enterprise/industrial agreements/awards
• environments ranging from simple to complex and diverse
• ethical standards established by the organisation
• financial accountability including profit and loss statements
• human resource policies and practices including interviewing, counselling, dispute settling and discipline
• legislation, codes and practices
• productivity and profitability objectives and targets
• quality and continuous improvement processes and standards
• resource parameters which may be defined or negotiated
• training and development principles and practices
• work schedules which may include shift work and varying hours of duty.
Resources may include, but are not limited to:
- people
- finance
- equipment
- environment
- buildings/facilities
- technology
- information.

Negotiations may be with a variety of internal or external sources and be:
- formal or informal
- short term or ongoing
- multi-lingual and cross-cultural
- enterprise agreements
- legislation regulation compliance

and include relative authorities, project managers, employees, contractors, customers and the community.

Consultation would typically include:
- regulatory authorities
- tenderers
- project managers
- contractors
- employees
- community
- customers
- suppliers.

**EVIDENCE GUIDE**

This guideline is to assist the development of assessment instruments/tools to assess the competence of mining managers. At this level, mining managers must provide evidence of consistent achievement of this Unit's workplace outcomes.

1. **Context of Assessment**

   The ultimate competency outcome is for the candidate to be able to manage the risk assessment and control system and, in so doing, to satisfy the performance criteria and underpinning knowledge requirements agreed by the industry in this Competency Unit.

   Risk assessment and control system circumstances and requirements will differ markedly between mine sites. Therefore, there are limitations on the extent to which the practical establishment of a risk assessment and control system may be assessed in the workplace. To bridge this potential gap and to ensure the candidate is able to apply the extensive theory to a working situation, assessment is likely to include formal simulation exercises.

   The assessment system for this competency is to cover the following:
A. Theory and knowledge underpinning the competency which is a mandatory requirement

B. Application of theory to a generic practical situation/simulation

OR

C. Practical establishment of a risk assessment and control system.

Technical/Safety Management competency development in the Industry is to be designed to optimise aided learning of the essential underpinning knowledge and mentored workplace development of application skills.

Guidelines will be in line with statutory/legal requirements, enterprise specific policies and procedures and codes of practice.

2. Interdependent Assessment of Units

This unit covers five primary functions or outcomes being the establishment of the risk assessment and control system, processes to support the system, the implementation of the system, the audit of the system and the completion of records and reports. It therefore represents an activity which may result in a range of other management and technical competencies being invoked.

Where inter-dependent assessment can be clearly demonstrated to satisfy the specialised requirements of a number of units, and do so in a transparent and timely manner, the assessment should be on an holistic basis.

3. Critical Aspects of Evidence. The Industry has established that, for portability purposes, it is essential that competency in this unit reflects successful assessment in the critical aspects of behaviours and outcomes which require the candidate to:

- apply personal, operational safety and health requirements
- interpret and communicate technical risk assessment and control processes
- establish strategies, structures and frameworks for the mine's risk assessment and control system
- identify and allocate risk assessment and control system responsibility
- establish information and training processes to support the mine's system
- implement the mine's risk assessment and control system
- audit the risk assessment and control system and processes
- maintain risk assessment and control records and reports
- coordinate and monitor actions and respond to changing situations.

4. Consistency of Performance. Consistency of performance in this unit is aided by the standards of performance within statutory and site rules, policies, procedures and regulations and by professional standards and practices established and observed by the Industry.

UNDERPINNING KNOWLEDGE
5. A knowledge of the listed topics/disciplines in sufficient scope and depth to enable the candidate to manage and enhance positive outcomes in the design, implementation, maintenance and evaluation of the mine's risk assessment and control system.

A knowledge of:

- action planning methods
- advanced negotiation skill
- advanced written and oral communication methods
- company policy
- environmental management
- hazard control and management systems
- hazard control documentation methods
- hazard management processes and techniques
- human resource management
- method of identifying appropriate action based on cost, safety, and welfare issues
- mine operating procedures
- organisational goals and objectives
- receptive listening skills
- reporting and recording procedures
- statutory and site rules, policies, procedures and regulations
- statutory/legal control
- work procedure/instruction writing.

6. The ability to:

- develop and maintain hazard control procedures and policies
- read, interpret, apply and communicate technical information, rules, procedures, regulations etc
- provide leadership and guidance for group activities
- communicate effectively in the workplace
- facilitate and document risk control planning
- maintain relevant records and documents
- monitor and decide on changes to process
- explain complex information to superiors/subordinates
- provide coaching and mentoring support
- read, interpret and apply legislation
- adopt communications styles appropriate to listeners and situations, including selecting an appropriate time and place
- take a leading role in initiating action and making decisions
- listen actively, ask questions, clarify points and rephrase others' statements to check mutual understanding
- show sensitivity to the needs and feelings of others
- actively encourage the free exchange of information
- produce a variety of solutions before making a decision
- show respect for the views and actions of others
- produce own ideas from experience and practice
- present yourself positively to others.

### Key Competencies

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<th>Level 2</th>
<th>3</th>
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</table>
**MNIC03A Establish mine infrastructure and plant systems**

**Description:** This unit covers the use of appropriate measures and criteria to establish the mine infrastructure and plant systems. Its application provides for the strategic management functions required to plan, develop and establish the mine infrastructure and plant systems to the point where procurement and/or construction may commence.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>C3.1 Establish or Confirm the Mine's Operational Strategy.</td>
<td>C3.1.1 Statutory/legal approvals are obtained and/or confirmed.</td>
</tr>
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<td></td>
<td>C3.1.2 Feasibility analysis is completed and/or confirmed.</td>
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<td></td>
<td>C3.1.3 Detailed business and marketing plans/budgets/financial models/rehabilitation and contingency plans are prepared in accordance with the business feasibility analysis.</td>
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<td>C3.1.4 General mine development proposal is prepared and submitted to the organisation's board for endorsement.</td>
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<td></td>
<td>C3.1.5 Strategic resource planning information is collected, analysed and organised in preparation for decision-making.</td>
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<tr>
<td></td>
<td>C3.1.6 Estimates of resource requirements and utilisation reflect customer requirements, the organisation's business plans and the financial benefit to the organisation of providing products and services.</td>
</tr>
<tr>
<td>C3.2 Develop and Test the Detailed Mine Infrastructure Proposal.</td>
<td>C3.2.1 The legislative, statutory and likely site requirements related to infrastructure are accessed, identified and interpreted.</td>
</tr>
<tr>
<td></td>
<td>C3.2.2 The requirements for and purpose of infrastructure items are identified in accordance with mine design and system of mining.</td>
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<tr>
<td></td>
<td>C3.2.3 Specifications for infrastructure items are developed from a comprehensive analysis of site requirements.</td>
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<tr>
<td></td>
<td>C3.2.4 Infrastructure options are identified from an analysis of all relevant technical, operational and financial information.</td>
</tr>
</tbody>
</table>
C3.2.5 Preferred infrastructure options are selected on the basis of projected performance against specification requirements.

C3.2.6 Potential infrastructure sites/routes and capacities are assessed by visit, entered on the mine plan and confirmed.

C3.3 Develop and Test the Detailed Mine Plant Proposal.

C3.3.1 The legislative, statutory and site requirements related to plant are accessed, identified and interpreted.

C3.3.2 The requirements for and purpose of plant is identified in accordance with mine design and system of mining.

C3.3.3 Specifications for plant are developed from a comprehensive analysis of site requirements.

C3.3.4 Plant options are identified from an analysis of all relevant technical, operational and financial information.

C3.3.5 Preferred plant options are selected on the basis of projected performance against specification requirements.

C3.3.6 Potential sites for fixed plant are assessed by visit, entered on the mine plan and confirmed.

C3.4 Obtain and Record Mine Infrastructure and Plant System Approvals.

C3.4.1 Detailed proposals for the mine infrastructure components, layout, specifications and costs are prepared for approval processes.

C3.4.2 Detailed proposals for the mine plant items, specifications, the locations of fixed plant and the proposed costs of the plant are prepared for approval processes.

C3.4.3 Formal approvals are obtained for the proposed mine infrastructure and plant systems in accordance with enterprise policies.

C3.4.4 The mine infrastructure and plant systems records are varied to reflect any approval conditions and finalised in preparation for implementation.
DEFINITION OF TERMS

For the purposes of this standard, the definitions below apply:

**audit**
a systematic examination against defined criteria to determine whether activities and related results conform to planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve the organisation's policy and objectives.

**risk**
the combination of the frequency, or probability of occurrence, and consequence of a specified hazardous event.

**hazard**
a source or a situation with a potential for harm in terms of human injury or ill-health, damage to property, damage to the environment, or a combination of these.

**standard operating procedures (SOP)**
are also known as safe working procedures, safe operating procedures and standard working procedures.

RANGE OF VARIABLES

Mine infrastructure system may include buildings, offices, hygiene facilities, workshops, power supply, water management, roads and storage facilities for product, water, fuels, and explosives.

Mine plant may include fixed and mobile plant (see lists below).

This competency standard is applicable for those with managerial responsibilities. This may be as a Senior/Specialist Manager or as an owner of a business. These competencies may be applicable in combination with other industries, occupations or workplace specific competencies.

It is to be exhibited in the work area of managerial responsibility which might be an entire enterprise or department of an enterprise.

The competency involves application of relevant legislation and codes of practice, and the maintenance of records, provision of information and dealing with committees, statutory/legal agencies, organisational representatives.

Processes for consultation may include committees, consultation with statutory/legal agencies/site representatives, issue resolution procedures and participative/consultative procedures conducted by supervisory staff within the area of managerial responsibility.
Monitoring of activities may include review of written reports, performance appraisal or auditing procedures.

**Management must comply with statutory/legal requirements. These may include:**

- boundaries, leases and tenements
- dangerous goods
- environmental - noise/air/water
- explosives
- harbours and marine
- mine safety and health requirements
- port authority
- rehabilitation
- royalties.

Title searches may include issues of land ownership, council, lease, by-laws, contamination and wildlife corridors.

**Planning and development may include variables such as:**

- interpreting and communicating information
- business/performance plans
- location
- tender specifications
- communication liaison/public relations
- resources
- statutory/legal/organisational requirements and control
- resource parameters
- best practice
- technical standards established by industry and/or enterprise
- legal issues/processes
- planning approvals
- surveying.

**Infrastructure/technology requirements would typically incorporate the following specifications:**

- environment
- health and safety
- hours per week of operation
- production rate
- products
- recyclable materials
- stack emissions
- transportation systems
- waste and stockpiles
- water/tailings management.

**Management interacts/negotiates with a range of parties which may include but are not limited to:**

- community
- contractors
- customers
- emergency services personnel
- employees
- operating managers
- project managers
- regulatory authorities
- safety and health committees/representatives
- stakeholders
- state/federal/local government
- suppliers
- tenderers.

**Resources may include, but are not limited to:**

- buildings/facilities
- equipment/plant
- finance
- information
- people
- power/energy
- technology
- time.

**Mine plant and equipment may include, but is not limited to:**

<table>
<thead>
<tr>
<th>INFRA-STRUCTURE</th>
<th>BUILDINGS</th>
<th>FIXED PLANT</th>
<th>CRUSHERS:</th>
<th>SCREENS:</th>
<th>CONVEYORS:</th>
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<td>Roads</td>
<td>Ablutions</td>
<td>Ammonium nitrate store</td>
<td>Attrition</td>
<td>Banana (sieve bend)</td>
<td>Belt</td>
</tr>
<tr>
<td>Dams</td>
<td>Amenities</td>
<td>Change room</td>
<td>Autogenous</td>
<td>Dewatering</td>
<td>Bucket</td>
</tr>
<tr>
<td>Settling ponds</td>
<td>Chemical stores</td>
<td>Chemical stores</td>
<td>Ball mill</td>
<td>Divergator</td>
<td>Chevron</td>
</tr>
<tr>
<td>Tanks</td>
<td>Control rooms</td>
<td>Control rooms</td>
<td>Cone</td>
<td></td>
<td>Overland - track</td>
</tr>
<tr>
<td>Bund walls</td>
<td>Dangerous goods store</td>
<td>Dangerous goods store</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
• Gyratory
• Impactor/Hammermill
• Jaw
• Rod mill
• Semi-autogenous
• Vert shaft impactor

• Harpwire
• Inclined/horizontal
• Sizers
• Trommel
• Vibratory

shiftable
• Screw
• Stackers
• Transportable
• Weighing devices

FEEDERS:
• Apron
• Belt
• Reciprocating plate
• Reclaim systems
• Track/Caterpillar
• Vibrating
• Weigh belt

SAND & FINES PROCES SING:
• Clarifier
• Classifiers
• Cyclones
• Filter press
• Log washer
• Screw
• Scrubber
• Thickener
• Thickeners
• Tubs

SEPARATORS:
• Biological oxidation
• Carbon in leach
• Carbon in pulp
• Electro-static
• Flotation cells
• Gravity cells
• Heavy media

MISCELLANEOUS:
• Concentrators
• Pipes and ducting
• Primary fans
• Refrigeration plant

ANCILLARY EQUIPMENT
• Air conditioner
• Bins
• Compressor
• Dust extractor
• Dust suppression
• Electric motors
• Generators
• Hoppers
• Hydraulic units
• Ladders
• Lighting
• Pumps
• Secondary fans
• Silos
• Stairways
• Substation
• Transformer
• Valves
• Walkways
• Weigh stations
• Welders

MOBILE PLANT
• Backhoe
• Barge
• Bucket wheel excavator
• Cherry picker
• Compressor
• Concrete agitator
• Crane
• Dozer
• Dragline
• Dredge
• Drill
• Dump-truck
• Excavator
• Explosives vehicle
• Face shovel
• Forklift
• Front end loader/LHD
• Generator
• Grader
• Integrated carrier
• Roller
• Scraper
• Service/Maintenance vehicle
• Skid-steerloader
• Truck/Hiab
• Watercart/truck
1. **Context of Assessment**

The ultimate competency outcome is for the candidate to be able to establish mine infrastructure and plant systems and, in so doing, to satisfy the performance criteria and underpinning knowledge requirements agreed by the industry in this Competency Unit.

Mine infrastructure and plant system circumstances and requirements will differ markedly between mine sites. Therefore, there are limitations on the extent to which the practical establishment of mine infrastructure systems may be assessed in the workplace. To bridge this potential gap and to ensure the candidate is able to apply the extensive theory to a working situation, assessment is likely to include formal simulation exercises.

The assessment system for this competency is to cover the following:

A. Theory and knowledge underpinning the competency which is a mandatory requirement
B. Application of theory to a generic practical situation/simulation which is a mandatory requirement

OR

C. Practical establishment of mine infrastructure and plant systems or equivalent activity.

There are special considerations in respect of Assessment C. It is unlikely that all candidates will be able, in terms of access, reasonable economic constraints and reasonable time frames, to physically establish all the range of possible mine systems.

In most cases it would be reasonable to infer competency if a candidate has completed assessments A and B in respect of each required competency and has satisfied assessment C in respect of one of the required systems. This inference is based on the fact that a candidate, who has competently established one system, would be capable of establishing other systems if they have satisfied the theory and generic applications, which form part of the required competencies.

Naturally, if this competency unit is being undertaken as a stand-alone unit rather than as one within a qualification cluster, Assessment C is to be treated as a mandatory requirement.

2. **Inter-dependent Assessment of Units**

Whilst there are some common features between the units at this level, commonality is generally limited to science and engineering theory and the planning process. This unit requires the specialised application of knowledge. Generalised assessment is unlikely to satisfy the requirements of this unit or of the other allied units.

Unless inter-dependent assessment can be clearly demonstrated to satisfy the specialised requirements of each subject unit, and do so in a transparent and timely manner, the assessment should be on a unit by unit basis.
This unit covers four primary functions or outcomes being the establishment of the mine's operational strategy, the development of the infrastructure and plant proposals, and the approval and recording processes. It therefore represents an activity which may result in a range of other management and technical competencies being invoked.

3. **Critical Aspects of Evidence.** The Industry has established that, for portability purposes, it is essential that competence in this unit reflects successful assessment in the critical aspects of:

- applying personal, operational safety and health procedures
- establishing and reviewing statutory/legal approval procedures
- applying strategic and operational planning principles
- applying financial planning principles
- applying mine design principles to minimise the likelihood of inappropriate mine infrastructure and plant
- identifying, evaluating and selecting mine infrastructure systems and equipment
- defining roles and responsibilities for the management of mine infrastructure and plant systems
- obtaining approvals for infrastructure and plant system proposals
- developing systems documentation covering mine infrastructure and plant.

4. **Consistency of Performance.** Consistency of performance in this unit is aided by the standards of performance, which are contained within State Legislation and by professional standards and practices established and observed by the Industry. Mine infrastructure and plant systems and their establishment are to meet Legislative and Industry standards.

**UNDERPINNING KNOWLEDGE**

5. A knowledge of the listed topics/disciplines in sufficient scope and depth to enable the candidate to plan, develop, or cause to be developed, and establish and maintain the mine infrastructure and plant system.

A knowledge of:

- business planning
- computer applications
- financial models
- mine design
- mining operations, plant and equipment
- negotiation techniques
- organisational change and development
- organisational objectives
- planning and strategic management
- project management
- resource quantification
- risk management
- statutory/legal control
- surveying
- titles management.
6. The ability to:

- develop/review business plans
- develop resource plans
- prepare project budgets
- research titles
- gain statutory/legal approvals
- implement project management strategies
- implement change
- access and use appropriate technologies
- prepare and present management reports
- negotiate with internal/external customers, community and statutory/legal authorities
- resolve conflict
- access, interpret and apply:
  - technical information
  - site/legislative requirements
  - records and reports
  - briefings and handover details
- apply the principles of mine design
- assess the risks and consequences attached to mine infrastructure and plant
- plan and coordinate work
- identify training needs related to mine infrastructure systems
- interpret and apply manufacturers’ instructions
- conduct maintenance surveys.

**KEY COMPETENCIES**

<table>
<thead>
<tr>
<th>Key Competency</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collecting, analysing &amp; organising information</td>
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<td>Communicating ideas &amp; information</td>
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<td>Solving Problems</td>
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<tr>
<td>Using technology</td>
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**MNIC04A Establish mine services systems**

Description: This unit covers the use of appropriate measures and criteria to establish safe mine services systems.

Its application provides for the strategic management functions required to develop and establish safe mine services systems.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| C4.1 Design Mine Services Systems. | C4.1.1 The legislative, statutory and site requirements related to mine services management systems are accessed, interpreted and clarified.  
C4.1.2 The requirements for and purpose of mine services systems are identified in accordance with legislative requirements and the system of mining.  
C4.1.3 A specification for the mine services system is developed from a comprehensive analysis of site requirements.  
C4.1.4 System options are identified from an analysis of all relevant technical, operational and financial information.  
C4.1.5 The preferred service systems options, including reticulation are selected on the basis of performance against specification requirements. |
| C4.2 Select Equipment for Mine Services Systems. | C4.2.1 The requirements for and purpose of mine services equipment are identified against systems requirements.  
C4.2.2 A detailed scoping of the work requirement is conducted and key selection criteria, including hazard identification and risk analysis, is developed.  
C4.2.3 A specification for the required mine services equipment is developed.  
C4.2.4 The preferred equipment solutions are selected on the basis of performance against specification requirements. |

(continued)
<table>
<thead>
<tr>
<th>C4.3</th>
<th>Establish Installation and Commissioning Procedures.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C4.3.1</td>
<td>A procedure to identify hazards and analyse and evaluate risks associated with the installation of mine services systems and equipment is established.</td>
</tr>
<tr>
<td>C4.3.2</td>
<td>Integration of new and existing systems and processes is planned and prepared for to achieve optimum performance.</td>
</tr>
<tr>
<td>C4.3.3</td>
<td>Safe operating procedures and rules are developed from a detailed analysis of site requirements.</td>
</tr>
<tr>
<td>C4.3.4</td>
<td>Procedures for installing and commissioning mine services systems and equipment are developed and established.</td>
</tr>
<tr>
<td>C4.3.5</td>
<td>A program, including systems and procedures, to satisfy identified mine services training requirements is established.</td>
</tr>
<tr>
<td>C4.3.6</td>
<td>Emergency response and evacuation systems, plans and procedures are established in accordance with site requirements.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C4.4</th>
<th>Establish Systems for the Operation and Maintenance of Mine Services Systems and Equipment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C4.4.1</td>
<td>Operational procedures for mine services systems and equipment, are developed from site and legislative requirements and incorporated into site documentation.</td>
</tr>
<tr>
<td>C4.4.2</td>
<td>Maintenance procedures for mine services systems and equipment are developed from site and legislative requirements and incorporated into site documentation.</td>
</tr>
<tr>
<td>C4.4.3</td>
<td>Procedures for reviewing and modifying work processes are developed and established.</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>C4.5</th>
<th>Establish Systems for Audit and Review of Mine Services Systems and Equipment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C4.5.1</td>
<td>Procedures to evaluate and confirm system/equipment compliance with statutory and site requirements are established.</td>
</tr>
<tr>
<td>C4.5.2</td>
<td>Future mine services systems and equipment requirements are identified, assessed and incorporated into planning processes.</td>
</tr>
<tr>
<td>C4.5.3</td>
<td>Procedures to confirm the currency and compliance of mine services maintenance and safety standards are established.</td>
</tr>
<tr>
<td>C4.5.4</td>
<td>The system for recording and reporting of mine services and equipment information is</td>
</tr>
</tbody>
</table>
C4.5.5 The mine services training program is audited for currency and relevance.

C4.5.6 Procedures for incorporating feedback into the audit/review system is established.

C4.5.7 Emergency response and evacuation systems, plans and procedures are audited for compliance with site requirements.

C4.5.8 Procedures for response to instances of non-compliance or other discrepancies/deficiencies revealed by audit are established.

**DEFINITION OF TERMS**

For the purpose of this standard, the definitions below apply.

**audit** a systematic examination against defined criteria to determine whether activities and related results conform to planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve the organisation's policy and objectives.

**risk** the combination of the frequency, or probability of occurrence, and consequence of a specified hazardous event.

**hazard** a source or a situation with a potential for harm in terms of human injury or ill-health, damage to property, damage to the environment, or a combination of these.

**standard operating procedures (SOP)** are also known as safe working procedures, safe operating procedures and standard working procedures.

**RANGE OF VARIABLES**

Mine services may include, but not be limited to, power (air, gas, electricity, water, diesel, low energy source), water, wastewater, fire fighting, gas drainage, fuel, waste disposal, condition monitoring, dust suppression and refrigeration.

A service system includes the functions of design, development, establishment, installation, operations, protection, maintenance, monitoring and recording and reporting process.

Support systems may include, but not be limited to, mine plans, signage, stores system, roadway, development drives and openings, maintenance and drilling (raise boring and bore hole) and emergency response systems.
Emergency response systems may include refuge chambers, designated escape ways, evacuation procedures, alarm systems, guidance systems, emergency communication systems, self-aided escape apparatus and mines rescue capability.

Protection systems may include, but not be limited to, explosion barriers, electrical protection, compressed air protection, hydraulic protection, environment protection, falling and roll-over protection, mechanical protection, frictional ignition protection, guarding and personal protection.

Reticulation may include water management, pumping of solids, fluid reticulation and storage, material reticulation and storage (hydraulic, electric, water and compressed air). Reticulation system may be electrical or mechanical.

Communication system may include, but not be limited to, oral, phones, radios, electronic, microwave and telemetry.

Reporting and recording systems include site requirements and consist of phones, radios, computer systems, verbal and written.

Safety services may include, but not be limited to, risk assessment process, fire fighting, first aid and mines rescue.

Safety information and standards may be contained in legislation and regulations, relevant Australian standards, management plans, manager's rules, safety and health policy, codes of practice, manufacturers' instructions and standard/safe working or job procedures (or equivalent), industry guidelines.

Site documentation and training policy may include, but not be limited to, statutory and legislative requirements, management plans and procedures.

Specifications may include, but not be limited to, performance requirements, costs, dimensions, capacity, safety and health requirements, training requirements, and key selection criteria.

Site policy, objectives, rules and procedures will vary from site to site.

**Statutory/legal compliance may include but is not limited to:**

- common law
- communications
- dangerous goods
- development of training policies/programmes to aid compliance
- emergency services
- explosives
- industrial relations
- local government
- minerals and extractive industry licensing
- mining legislation
- navigation
- petroleum and gas
- planning and assessment
- safety and health
• trade practices
• waterways
• weights and measures
• workers compensation/workcover.

In accordance with all relevant statutory/legal requirements, particularly:

• requirements for the maintenance of records for statutory/legal breaches
• provision of information and training
• regulations, guidelines and codes of practice relating to statutory/legal compliance
• site representatives and committees
• issue resolution.

Resources may include, but are not limited to:

• people
• finance
• equipment
• environment
• buildings/facilities
• technology
• information.

Negotiations may be with a variety of internal or external sources and be:

• formal or informal
• short term or ongoing
• multi-lingual and cross-cultural
• enterprise agreements
• legislation regulation compliance

and include relative authorities, project managers, employees, contractors, customers and the community.

Consultation would typically include:

• regulatory authorities
• tenderers
• project managers
• contractors
• employees
• community
• customers
• suppliers.

**EVIDENCE GUIDE**

1. Context of Assessment
The ultimate competency outcome is for the candidate to be able to establish mine services systems and, in so doing, to satisfy the performance criteria and underpinning knowledge requirements agreed by the industry in this Competency Unit.

Mine services systems circumstances and requirements will differ markedly between mine sites. Therefore, there are limitations on the extent to which the practical establishment of mine services systems may be assessed in the workplace. To bridge this potential gap and to ensure the candidate is able to apply the extensive theory to a working situation, assessment is likely to include formal simulation exercises.

The assessment system for this competency is to cover the following:

A. Theory and knowledge underpinning the competency which is a mandatory requirement

B. Application of theory to a generic practical situation/simulation which is a mandatory requirement

OR

C. Practical establishment of mine services systems or equivalent activity.

There are special considerations in respect of Assessment C. Technical/safety management competencies at this level require a candidate to establish a range of systems. It is unlikely that all candidates will be able, in terms of access, reasonable economic constraints and reasonable time frames, to physically establish all these systems.

In most cases it would be reasonable to infer competency if a candidate has completed assessments A and B in respect of each required competency and has satisfied assessment C in respect of one of the required systems. This inference is based on the fact that a candidate, who has competently established one system, would be capable of establishing other systems if they have satisfied the theory and generic applications, which form part of the required competencies.

Naturally, if this competency unit is being undertaken as a stand-alone unit rather than as one within a qualification cluster, Assessment C is to be treated as a mandatory requirement.

2. Inter-dependent Assessment of Units

Whilst there are some common features between the units at this level, commonality is generally limited to science and engineering theory and the planning process. This unit requires the specialised application of knowledge. Generalised assessment is unlikely to satisfy the requirements of this unit or of the other allied units.

Unless inter-dependent assessment can be clearly demonstrated to satisfy the specialised requirements of each subject unit, and do so in a transparent and timely manner, the assessment should be on a unit by unit basis.

This unit covers five primary functions or outcomes being the design of the mine services systems, the selection of equipment, establishing the installation and commissioning procedures, establishing systems for the operation and maintenance of mine services systems and equipment and establishing the systems for auditing and review of the mine services.
systems and equipment. It therefore represents an analysis activity that may result in a range of other management and technical competencies being invoked.

3. **Critical Aspects of Evidence.** The Industry has established that, for portability purposes, it is essential that competence in this unit reflects successful assessment in the critical aspects of:

- applying personal and operational safety procedures
- interpreting and communicating information on mine services systems operations
- identifying hazards and the management of risks associated with mine services systems
- applying mine design principles to minimise the likelihood of inappropriate mine services systems and equipment
- evaluating and selecting mine services systems and equipment
- defining roles and responsibilities for management of mine services systems
- establishing the operational and maintenance systems for mine services systems and equipment
- establishing and reviewing statutory reporting procedures
- reviewing the mine services training program
- reviewing and auditing the effectiveness of the mine services
- establishing and reviewing mine services related emergency response procedures.

4. **Consistency of Performance.** Consistency of performance in this unit is aided by the standards of performance, which are contained within State Legislation and by professional standards and practices established and observed by the Industry. Mine services systems and their establishment are to meet Legislative and Industry standards.

**UNDERPINNING KNOWLEDGE**

5. A knowledge of the listed topics/disciplines in sufficient scope and depth to enable the candidate to design, develop and establish the mine services system.

A knowledge of:

- audit review process and techniques
- computer based systems
- emergency response and disaster planning processes and techniques
- fire fighting systems and precautions
- legislative and site specific requirements for mine services including, but not limited to, mine plans, electrical distribution, ventilation, compressed air, electrical/mechanical equipment, inspection requirement, environmental management, communication, emergency procedures, risk management, recording and reporting, mines rescue, safety and health, manufacturers' instructions, standard work procedures, training and fire fighting
- maintenance surveys
- mine design relating to mine services systems
- mine operating procedures including those applying to transport systems, conveyor systems, systems of mining, ventilation system, gas management and mine water management
- power sources including electrical, hydraulic, compressed air, diesel
• safety design features for maintenance of mine services systems
• safety design features of mine services systems
• stores systems
• training programs.

UNDERPINNING SKILLS

6. The ability to:

• access, interpret and apply:
  - technical information
  - site/legislative requirements
  - records and reports
  - briefings and handover details
• apply the principles of mine design
• assess the risks and consequences attached to mine services systems and equipment
• plan and coordinate work
• identify training needs related to mine services systems
• interpret and apply manufacturers' instructions
• conduct maintenance surveys.

KEY COMPETENCIES

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<thead>
<tr>
<th>Key Competency</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
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<tr>
<td>Collecting, analysing &amp; organising information</td>
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<td>Communicating ideas &amp; information</td>
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<td>Solving Problems</td>
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<td>Using technology</td>
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MNIC05A Establish plant, equipment and infrastructure maintenance systems

Description: This unit covers the use of appropriate measures and criteria to establish plant, equipment and infrastructure maintenance systems.

Its application provides for the strategic management functions required to develop, establish and maintain mine plant, equipment and infrastructure maintenance systems.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>C5.1 Establish Installation and Commissioning Procedures for Plant, Equipment and Infrastructure.</td>
<td>C5.1.1 Procedures to identify hazards and analyse and evaluate risks associated with plant, equipment and infrastructure are established.</td>
</tr>
<tr>
<td></td>
<td>C5.1.2 Integration of new and existing plant and equipment and processes is planned and prepared for to achieve optimum performance.</td>
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<td></td>
<td>C5.1.3 Safe operating procedures and rules are developed from a detailed analysis of work site and legislative requirements.</td>
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<tr>
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<td>C5.1.4 Plant and equipment installation and commissioning procedures are developed and established.</td>
</tr>
<tr>
<td></td>
<td>C5.1.5 Infrastructure construction/fabrication and commissioning procedures are developed and established.</td>
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<td></td>
<td>C5.1.6 A program, including systems and procedures, to satisfy identified plant, equipment and infrastructure training requirements, is established.</td>
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<td>C5.1.7 Emergency response and evacuation plans and procedures are established in accordance with site requirements.</td>
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<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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<tbody>
<tr>
<td>C5.2 Establish Systems for the Operation and Maintenance of Plant and</td>
<td>C5.2.1 Operational procedures for plant and equipment usage are developed from site and legislative requirements and manufacturers' information</td>
</tr>
</tbody>
</table>
C5.2.2 Maintenance systems and procedures for plant and equipment are developed from site and legislative requirements, enterprise maintenance concepts and manufacturers' instructions.

C5.2.3 Maintenance systems documentation is developed and distributed.

C5.2.4 Procedures for reviewing and modifying work processes are developed and established.

C5.3.1 Operational procedures for mine infrastructure usage are developed from site and legislative requirements and manufacturers' information and incorporated into site documentation.

C5.3.2 Maintenance systems and procedures for mine infrastructure are developed from site and legislative requirements, enterprise maintenance concepts and providers' instructions.

C5.3.3 Maintenance systems documentation is developed and distributed.

C5.3.4 Procedures for reviewing and modifying work processes are developed and established.

C5.4.1 Procedures to evaluate and confirm plant, equipment and infrastructure maintenance compliance with statutory and site requirements are established.

C5.4.2 Future plant, equipment and infrastructure systems and equipment requirements are identified, assessed and incorporated into planning processes.

C5.4.3 Procedures to confirm the currency and compliance of plant, equipment and infrastructure maintenance and safety standards are established.

C5.4.5 The system for recording and reporting of plant, equipment and infrastructure information is established.
C5.4.6 Procedures for incorporating feedback into the audit/review system are established.

C5.4.6 Procedures to confirm the currency, relevance and compliance of the training program against identified requirements are established.

C5.4.7 Procedures for response to instances of non-compliance or other discrepancies deficiencies revealed by audit are established.

**DEFINITION OF TERMS**

For the purposes of this standard, the definitions below apply:

- **audit**: a systematic examination against defined criteria to determine whether activities and related results conform to planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve the organization's policy and objectives.

- **risk**: the combination of the frequency, or probability of occurrence, and consequence of a specified hazardous event.

- **hazard**: a source or a situation with a potential for harm in terms of human injury or ill-health, damage to property, damage to the environment, or a combination of these.

- **standard operating procedures (SOP)**: are also known as safe working procedures, safe operating procedures and standard working procedures.

**RANGE OF VARIABLES**

This competency standard is applicable for those with managerial responsibilities. This may be as a Senior/Specialist Manager or as an owner of a business. These competencies may be applicable in combination with other industries, occupations or workplace specific competencies.

It is to be exhibited in the work area of managerial responsibility which might be an entire enterprise or department of an enterprise.

The competency involves application of relevant legislation and codes of practice, and the maintenance of records, provision of information and dealing with committees, statutory/legal agencies, organisational representatives.

Processes for consultation may include committees, consultation with statutory/legal agencies/site representatives, issue resolution procedures and participative/consultative procedures conducted by supervisory staff within the area of managerial responsibility.
Monitoring of activities may include review of written reports, performance appraisal or auditing procedures.

**Statutory/legal compliance may include but is not limited to:**

- common law
- communications
- dangerous goods
- development of training policies/programmes to aid compliance
- emergency services
- explosives
- industrial relations
- local government
- minerals and extractive industry licensing
- mining legislation
- navigation
- petroleum and gas
- planning and assessment
- safety and health
- trade practices
- waterways
- weights and measures
- workers compensation/workcover.

Actions are in accordance with all relevant statutory/legal requirements, particularly:

- Requirements for the maintenance of records for statutory/legal breaches
- Provision of information and training
- Regulations, guidelines and codes of practice relating to statutory/legal compliance
- Site representatives and committees
- Issue resolution.

**Resources may include, but are not limited to:**

- people
- finance
- equipment
- environment
- buildings/facilities
- technology
- information.

**Negotiations may be with a variety of internal or external sources and be:**

- formal or informal
- short term or ongoing
- multi-lingual and cross-cultural
- enterprise agreements
- legislation regulation compliance

and include relative authorities, project managers, employees, contractors, customers and the community.
Consultation would typically include:
- regulatory authorities
- tenderers
- project managers
- contractors
- employees
- community
- customers
- suppliers.

Mine plant and equipment may include, but is not limited to:

<table>
<thead>
<tr>
<th>INFRA-STRUCTURE</th>
<th>CRUSHERS:</th>
<th>SCREENS:</th>
<th>CONVEYORS:</th>
</tr>
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<tbody>
<tr>
<td>Roads</td>
<td>Attrition</td>
<td>Banana (sieve bend)</td>
<td>Belt</td>
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<tr>
<td>Dams</td>
<td>Autogenous</td>
<td>Dewatering</td>
<td>Bucket</td>
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<td>Settling ponds</td>
<td>Ball mill</td>
<td>Divergator</td>
<td>Chevron</td>
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<tr>
<td>Tanks</td>
<td>Cone</td>
<td>Harpwire</td>
<td>Overland - track shiftable</td>
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<td>Bund walls</td>
<td>Gyratory</td>
<td>Inclined/horizontal</td>
<td>Screw</td>
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<td>Impactor/Hammermill</td>
<td>Sizers</td>
<td>Stackers</td>
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<td></td>
<td>Jaw</td>
<td>Trommel</td>
<td>Transportable</td>
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<td></td>
<td>Rod mill</td>
<td>Vibratory</td>
<td>Weighbridge</td>
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<td>Semi-autogenous</td>
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<td>Workshops</td>
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<td>Vert shaft impactor</td>
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<th>FEEDERS:</th>
<th>SAND &amp; FINES PROCESSING:</th>
<th>SEPARATORS:</th>
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<td>Apron</td>
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<td>Biological oxidation</td>
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<td>Belt</td>
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<tr>
<td>Reciprocating plate</td>
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</table>
1. **Context of Assessment**

The ultimate competency outcome is for the candidate to be able to establish mine plant, equipment and infrastructure maintenance systems and, in so doing, to satisfy the performance criteria and underpinning knowledge requirements agreed by the industry in this Competency Unit.

Mine plant, equipment and infrastructure maintenance systems circumstances and requirements will differ markedly between mine sites. Therefore, there are limitations on the...
extent to which the practical establishment of the systems may be assessed in the workplace. To bridge this potential gap and to ensure the candidate is able to apply the extensive theory to a working situation, assessment is to include formal simulation exercises.

The assessment system for this competency is to cover the following:

A. Theory and knowledge underpinning the competency which is a mandatory requirement
B. Application of theory to a generic practical situation/simulation which is a mandatory requirement

OR

C. Practical establishment of mine plant, equipment and infrastructure maintenance systems or equivalent activity.

There are special considerations in respect of Assessment C. It is unlikely that all candidates will be able, in terms of access, reasonable economic constraints and reasonable time frames, to physically establish the range of systems.

In most cases it would be reasonable to infer competency if a candidate has completed assessments A and B in respect of each required competency and has satisfied assessment C in respect of one of the required systems. This inference is based on the fact that a candidate, who has competently established one system, would be capable of establishing other systems if they have satisfied the theory and generic applications which form part of the required competencies.

Naturally, if this competency unit is being undertaken as a stand alone unit rather than as one within a qualification cluster, Assessment C is to be treated as a mandatory requirement.

2. **Inter-dependent Assessment of Units**

Whilst there are some common features between the units at this level, commonality is generally limited to science and engineering theory and the planning process. This unit requires the specialised application of knowledge. Generalised assessment is unlikely to satisfy the requirements of this unit or of the other allied units.

Unless inter-dependent assessment can be clearly demonstrated to satisfy the specialised requirements of each subject unit, and do so in a transparent and timely manner, the assessment should be on a unit by unit basis.

This unit covers four primary functions or outcomes being the establishment of installation and commissioning procedures, the establishment of maintenance systems for plant, equipment and infrastructure and establishing of systems for audit and review of maintenance systems. It therefore represents an activity which may result in a range of other management and technical competencies being invoked.

3. **Critical Aspects of Evidence.** The Industry has established that, for portability purposes, it is essential that competence in this unit reflects successful assessment in the critical aspects of:

- applying personal, operational, safety and health procedures
- interpreting and communicating information on plant, equipment and infrastructure maintenance systems
• evaluating and selecting plant, equipment and infrastructure maintenance systems
• defining roles and responsibilities for management of plant, equipment and infrastructure maintenance
• documenting the operational and maintenance procedures for plant, equipment and infrastructure systems
• identifying hazards and managing risks related to plant, equipment and infrastructure maintenance systems
• establishing and reviewing statutory reporting procedures
• establishing and undertaking maintenance contract arrangements
• reviewing the maintenance system training program
• reviewing and auditing the effectiveness of the maintenance system
• establishing and reviewing the maintenance related emergency response and disaster plans and procedures.

4. **Consistency of Performance.** Consistency of performance in this unit is aided by the standards of performance, which are contained within State Legislation and by professional standards and practices established and observed by the Industry. Mine maintenance systems and their establishment are to meet Legislative and Industry standards.

**UNDERPINNING KNOWLEDGE**

5. **A knowledge of the listed topics/disciplines in sufficient scope and depth to enable the candidate to develop (or cause to be developed) and establish plant, equipment and infrastructure maintenance systems.**

A knowledge of:

• legislative, statutory, Australian standards and site specific requirements for plant and infrastructure including, but not limited to, mine plan, power supply systems, electrical/mechanical equipment, inspection requirements, communications, emergency procedures, risk management, recording and reporting, mines rescue, safety and health, manufacturers’ instructions, standard work procedures, training, fire fighting, handling and storage of dangerous goods, local government and power authority requirement
• mine design principles and procedures relating to fixed plant and infrastructure systems
• safety design features for maintenance of fixed plant and infrastructure
• mine operation systems and procedures including transport systems, conveyor systems, systems of mining, ventilation systems, gas management systems and mine water management systems
• stores systems
• roadway maintenance and drilling
• protection systems
• reticulation systems
• specifications for fixed plant and infrastructure
• audit processes
• computer based systems
• training programs
• fire fighting systems and precaution rules
• maintenance surveys.
6. The ability to:

- access, interpret and apply:
  - technical information
  - site/legislative requirements
  - records and reports
  - briefings and handover details
- assess the risks and consequences attached to plant, equipment and infrastructure systems
- develop procedures appropriate to mine operations for management of plant, equipment and infrastructure systems
- plan and coordinate work
- identify training needs related to plant, equipment and infrastructure systems
- interpret manufacturers' instructions
- conduct maintenance survey.

### KEY COMPETENCIES

<table>
<thead>
<tr>
<th>Key Competency</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
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<tr>
<td>Collecting, analysing &amp; organising information</td>
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<td>Using mathematical ideas &amp; techniques</td>
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<td>Solving Problems</td>
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<tr>
<td>Using technology</td>
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</table>
Establish the mine water management system

Description: This unit covers the use of appropriate measures and criteria to establish the Mine Water Management System.

Mine water system includes all actions to obtain, introduce and distribute the water required for operations (both potable and process water). It also includes the treatment of water and the disposal of excess, unwanted and/or waste water from the site.

Its application provides for the actions taken to identify, research, establish, manage and maintain the Mine Water Management System.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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<tbody>
<tr>
<td>C6.1 Identify and Research Organisation's Needs.</td>
<td>C6.1.1 Organisation goals, objectives and strategies are analysed to gain direction as to the type of research to be undertaken.</td>
</tr>
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<td></td>
<td>C6.1.2 Environments are investigated and analysed, to develop options, strategies and anticipated outcomes.</td>
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<td>C6.1.3 Existing system and equipment suitability is evaluated, taking into account operational requirements, safety and health issues and environmental legislation/regulations.</td>
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<td>C6.1.4 New systems are researched, evaluated, selected and purchased, in line with operational and budget requirements, safety and health and environmental legislation/regulations.</td>
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<td></td>
<td>C6.1.5 Research information is analysed and interpreted to establish options and opportunities.</td>
</tr>
<tr>
<td>C6.2 Carry Out Environmental Scan.</td>
<td>C6.2.1 Internal and external stakeholders are involved in the planning process in a way, which uses their contribution effectively and gains their support for the outcomes.</td>
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<td></td>
<td>C6.2.2 Strategies and systems are established to support analysis of the environment.</td>
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<td></td>
<td>C6.2.3 The environment is scanned to identify and assess the factors, which impact on mine development.</td>
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<tr>
<td></td>
<td>C6.2.4 Market opportunities are identified and explored to assist the organisation to forecast trends and</td>
</tr>
<tr>
<td>C6.2.5</td>
<td>Quantity and quality of requirements and excesses are determined.</td>
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<tr>
<td>C6.2.6</td>
<td>Threats and opportunities are identified, analysed and used to optimise project outcomes.</td>
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<tr>
<td>C6.2.7</td>
<td>Titles search is undertaken.</td>
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<tr>
<td>C6.2.8</td>
<td>Legal obligations are identified and documented.</td>
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<tr>
<th>C6.3</th>
<th>Develop, Implement and Maintain Procedures for the Mine Water Management System.</th>
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<tbody>
<tr>
<td>C6.3.1</td>
<td>Contingency plans are developed and implemented for flood routing of water in operational area covering peak flows.</td>
</tr>
<tr>
<td>C6.3.2</td>
<td>Site plan from engineering detail and construct storage areas, culverts, channels, pipeworks, trenches, manhole, gully pits as part of surface drainage and total reticulation network servicing the life of the mine is developed and implemented.</td>
</tr>
<tr>
<td>C6.3.3</td>
<td>Procedures for pumping waters from mine, settlement ponds, holding or tailing dams or sump sites are developed.</td>
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<tr>
<td>C6.3.4</td>
<td>Procedures for basic Civil Engineering principles to water flow, reticulation techniques and earthwork activities associated with drainage and rural road geometry are developed.</td>
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<tr>
<th>C6.3.5</th>
<th>Staged development of civil aspects to the work site is planned and interpreted.</th>
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<tbody>
<tr>
<td>C6.3.6</td>
<td>Water treatment systems are designed to meet specifications.</td>
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<tr>
<td>C6.3.7</td>
<td>Procedures for maintenance work for the drainage scheme of the mine site including pitworks, roadways, administration areas and boundary conditions is developed.</td>
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<tr>
<td>C6.3.8</td>
<td>Instructions and information on drainage requirements are communicated.</td>
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<tr>
<td>C6.3.9</td>
<td>Information and training systems to support water management are developed and implemented.</td>
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<tr>
<th>C6.4</th>
<th>Evaluate the Mine Water Management System.</th>
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<tbody>
<tr>
<td>C6.4.1</td>
<td>Performance indicators and criteria for the evaluation of statutory compliance and effectiveness of the water management system are identified and agreed.</td>
</tr>
<tr>
<td>C6.4.2</td>
<td>Site drainage and wastewater treatment is monitored against agreed indicators.</td>
</tr>
<tr>
<td>C6.4.3</td>
<td>Quality of site drainage effluent to meet environmental and company requirements is monitored and recorded.</td>
</tr>
</tbody>
</table>
C6.4.4 Hydrological effects and sensitive ecological/conservation sites are monitored.
C6.4.5 Instances of non-compliance with regulatory requirements are responded to in accordance with state/local government requirements.
C6.4.6 Instances of non-compliance with non-regulatory requirements are responded to and reported in accordance with company policy.

DEFINITION OF TERMS

For the purposes of this standard, the definitions below apply:

audit
a systematic examination against defined criteria to determine whether activities and related results conform to planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve the organisation's policy and objectives.

risk
the combination of the frequency, or probability of occurrence, and consequence of a specified hazardous event.

hazard
a source or a situation with a potential for harm in terms of human injury or ill-health, damage to property, damage to the environment, or a combination of these.

standard operating procedures (SOP)
are also known as safe working procedures, safe operating procedures and standard working procedures.

RANGE OF VARIABLES

Mine water system includes all actions to obtain, introduce and distribute the water required for operations (both potable and process water). It also includes the treatment of water and the disposal of excess, unwanted and/or waste water from the site.

Parameters of the water management system may include objectives, system boundaries, hazard and consequence types, methods, team processes, timings, venue/locations, and consultation processes.

Mine water management systems and measures include those focused on organisational goals, objectives and strategies, resources, internal and external stakeholders, environmental factors, which impact on mine development.

The organisation's internal policy, goals and/or objectives must determine the criteria for acceptable risk.
Records and reports for Risk Assessment may include a full report including Objective, Method, Results and Recommendations, the Risk Assessment Forms, Action Planning documents, etc.

Site policy, objectives, rules and procedures will vary from site to site.

**Management operates within:**
- a diverse range of plant/equipment, products and services
- appropriate policies, guidelines and processes, legislation/codes and practices
- business and performance plans
- enterprise/industrial agreements/awards
- environmental standards
- environments ranging from small/medium/large operations
- established quality and continuous improvement processes
- ethical standards established by the organisation
- human resource practices and policies
- international best practice and benchmarking principles and practices
- learning organisation principles and practices
- productivity and profitability objectives and targets
- resource parameters which may be defined or negotiated
- strategic plans developed by the organisation
- technical standards established by industry and/or enterprise
- training and development systems.

**Management is responsible for but is not limited to:**
- evaluating equipment/plant and power requirements for mining operations
- monitoring project timeframes against budget
- developing detailed site plans and working drawings
- establishing a rehabilitation plan in line with regulative requirements
- establishing and managing positive relations with others in the internal and external environment
- research which could include:
  - geological, climatic, hydrology/topography and environmental factors
  - cultural and biological environments
- monitoring water/equipment for leaching
- water run off monitoring for contaminants
- establishing bore fields
- knowledge of local rainfall
- measuring of water usage
- cost of water
- water wastage.

**Protecting:**
- water resource availability and quality
- quality of ground water resources
- surface waters and wetlands that are located downstream
- chemistry balance to maintain flora and fauna.

**Management must comply with statutory/legal requirements this may include:**
- boundaries, leases and tenements
• by-laws
• contamination
• council
• dangerous goods
• environmental - noise/air/water
• explosives
• freehold
• mine safety and health
• rehabilitation
• royalties
• wildlife corridors.

Statutory bodies may include, but are not limited to:
• Mineral Resources or appropriate body
• Safety and health authority
• Environmental/EPA
• Local Government
• Harbours and Marine
• Port authority
• Tenement authority
• Company policy and procedures.

Planning and development would typically include:
  − interpreting and communicating information
  − surveying
  − infrastructure/technology requirements and would typically incorporate the following specifications:
    * products
    * production rate
    * recyclable materials
    * stack emissions
    * hours per week of operation
    * waste and stockpiles
    * hydrants
    * dust suppression
    * groundwater quality and quantity
    * treatment methods
    * flow requirements
    * reticulation options
    * pumping requirements
    * storage capacities
    * water/tailings management
    * transportation systems
• All weather access/haul roads.

Permits required would include:
• Extractive
• Discharge
• Environment.

Site plans would include:
• layout of water reticulation system
• amenities
• culverts and drains
• topography
• controls
• reservoirs and dam sites.

Management interaction/negotiation may be with but is not limited to:
• stakeholders
• regulatory authorities
• tenderers
• operating managers
• project managers
• contractors
• employees
• community
• suppliers
• customers.

Resources may include, but are not limited to:
• people
• buildings/facilities
• finance
• equipment
• power/energy
• technology
• information
• time.

Water analysis would typically be:
• total dissolved solids
• turbidity
• heavy metals
• organics
• salinity
• acidity/alkalinity
• suspended solids
• hydrocarbons.

**EVIDENCE GUIDE**

This guideline is to assist the development of assessment instruments/tools to assess the competence of mining managers. At this level, mining managers must provide evidence of consistent achievement of this Unit's workplace outcomes.
1. **Context of Assessment**

The ultimate competency outcome is for the candidate to be able to establish the water management system and, in so doing, to satisfy the performance criteria and underpinning knowledge requirements agreed by the industry in this Competency Unit.

Water management circumstances and requirements will differ markedly between mine sites. Therefore, there are limitations on the extent to which the practical establishment of a water management system may be assessed in the workplace. To bridge this potential gap and to ensure the candidate is able to apply the extensive theory to a working situation, assessment is likely to include formal simulation exercises.

The assessment system for this competency is to cover the following:

A. Theory and knowledge underpinning the competency which is a mandatory requirement

B. Application of theory to a generic practical situation/simulation

OR

C. Practical establishment of water management system.

Technical/Safety Management competency development in the Industry is to be designed to optimise aided learning of the essential underpinning knowledge and mentored workplace development of application skills.

Guidelines will be in line with statutory/legal requirements, enterprise specific policies and procedures and codes of practice.

2. **Interdependent Assessment of Units**

Whilst there are some common features between the units at this level, commonality is generally limited to science and engineering theory and the planning process. This unit requires the specialised application of knowledge. Generalised assessment is unlikely to satisfy the requirements of this unit or of the other allied units.

Unless inter-dependant assessment can be clearly demonstrated to satisfy the specialised requirements of each subject unit, and do so in a transparent and timely manner, the assessment should be on a unit by unit basis.

This unit covers four primary functions or outcomes being the identification and research of the organisations needs, environmental scanning, the development, implementation and maintenance of mine water management procedures and the evaluation of the water management system. It therefore represents an activity which may result in a range of other management and technical competencies being invoked.

3. **Critical Aspects and Evidence**
The Industry has established that, for portability purposes, it is essential that competency in this unit reflects successful assessment in the critical aspects of behaviours and outcomes which require the candidate to:

- apply personal, operational safety and health requirements
- establish strategies, structures and frameworks for the mine's water management system
- identify hazards and manage risks related to water management
- identify and allocate water management process responsibility
- implement the mines water management systems
- coordinate and monitor actions and respond to changing situations
- establish information and training processes to support the mine's water management system
- maintain water management records and reports
- evaluate the water management system and processes
- establish and review water emergency response procedures.

4. **Consistency of Performance.** Consistency of performance in this unit is aided by the standards of performance within statutory and site rules, policies, procedures and regulations and by professional standards and practices established and observed by the Industry.

---

**UNDERPINNING KNOWLEDGE**

5. **A knowledge of the listed topics/disciplines in sufficient scope and depth to enable the candidate to manage and enhance positive outcomes in the design, implementation, maintenance and evaluation of the organisation's water management system.**

A knowledge of:

- computer applications
- customer/client relations
- drainage systems
- emergency response and disaster planning procedures
- environmental management
- financial management
- mine design relating to mine water management systems
- mine operating procedures including those applying to mine water management
- mine plant and equipment
- mine water management systems
- negotiation techniques
- organisational objectives
- quality systems
- resource monitoring
UNDERPINNING KNOWLEDGE …Continued…

- risk management: principles, strategies and applications
- safety and health requirements
- safety features for water management systems
- statistics
- statutory control requirements
- surveying
- team management
- training and assessment systems.

UNDERPINNING SKILLS

6. The ability to:

- access and use appropriate information management technologies
- analyse and review water management systems
- audit water management performance - energy, safety, environment, quality assurance, legislative compliance
- control operating costs
- co-ordinate resources - human, financial and physical
- deliver and maintain services to required specifications
- develop business/resource plans
- evaluate new and used equipment using appropriate techniques
- gain statutory/legal approvals
- implement change
- manage equipment and maintenance systems
- manage people and processes
- manage projects and tasks
- monitor and maintain water management systems
- negotiate and finalise contracts
- negotiate with internal/external customers, community and statutory/legal authorities
- prepare and present management reports
- prepare operating budgets
- prepare tender specifications
- resolve conflict.

KEY COMPETENCIES

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<tr>
<th>Key Competency</th>
<th>1</th>
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<td>Solving Problems</td>
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Using technology
MNIC07A Establish the stockpile management system

Description: This unit covers the use of appropriate measures and criteria to establish the mine stockpile management system.

Its application provides for the strategic management functions required to develop, establish and maintain the mine stockpile management system.

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<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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| C7.1 Identify and Research Stockpile Requirements. | C7.1.1 Organisation goals, objectives and strategies are analysed.  
C7.1.2 The legislative, statutory and site requirements related to stockpile management systems are accessed, interpreted and clarified.  
C7.1.3 Environments are investigated and analysed, to develop options, strategies and anticipated outcomes.  
C7.1.4 Strategies, which translate the objectives into the planning process, are developed and implemented. |
| C7.2 Design Stockpile Configuration. | C7.2.1 The requirements for and purpose of stockpile management systems are identified in accordance with legislative requirements and the system of mining.  
C7.2.2 A specification for the stockpile system is developed from a comprehensive analysis of site requirements.  
C7.2.3 System options are identified from an analysis of all relevant technical, operational and financial information.  
C7.2.4 Economics and efficiency of the stockpiling system and configuration to be used is evaluated. |
| C7.3 Select Equipment for Stockpiling Management Systems. | C7.3.1 The requirements for and purpose of stockpile equipment are identified against systems requirements.  
C7.3.2 A detailed scoping of the work requirement is conducted and key selection criteria, including hazard identification and risk analysis, is developed.  
C7.3.3 The requirements for and purpose of stockpile |
C7.3.4 A specification for the required stockpile equipment is developed.

C7.3.5 The preferred equipment solutions are selected on the basis of performance against specification requirements.

C7.4 Establish Installation and Commissioning Procedures.

C7.4.1 A procedure to identify hazards and analyse and evaluate risks associated with the installation of stockpiling systems and equipment is established.

C7.4.2 Integration of new and existing systems and processes is planned and prepared for to achieve optimum performance.

C7.4.3 Safe operating procedures and rules are developed from a detailed analysis of site requirements.

C7.4.4 Procedures for installing and commissioning stockpile systems and equipment are developed and established.

C7.4.5 A program, including systems and procedures, to satisfy identified stockpiling training requirements is established.

C7.4.6 Emergency response and evacuation systems, plans and procedures are established in accordance with site requirements.

C7.5 Establish Systems for the Operation and Maintenance of Stockpile Management Systems.

C7.5.1 Operational procedures for stockpile systems and equipment are developed from site and legislative requirements and incorporated into site documentation.

C7.5.2 Maintenance procedures for stockpile systems and equipment are developed from site and legislative requirements and incorporated into site documentation.

C7.5.3 Procedures for reviewing and modifying work processes are developed and established.

C7.6 Establish Systems for Audit and Review of Stockpile Systems.

C7.6.1 Procedures to evaluate and confirm system/equipment compliance with statutory and site requirements are established.

C7.6.2 Future stockpile systems and equipment requirements are identified, assessed and incorporated into planning processes.

C7.6.3 Procedures to confirm the currency and compliance of stockpile maintenance and safety
standards are established.

C7.6.4 The system for recording and reporting of stockpile and equipment information is established.

C7.6.5 The stockpile training program is audited for currency and relevance.

C7.6.6 Procedures for incorporating feedback into the audit/review system is established.

C7.6.7 Emergency response and evacuation systems, plans and procedures are audited for compliance with site requirements.

C7.6.8 Procedures for response to instances of non-compliance or other discrepancies/deficiencies revealed by audit are established.

DEFINITION OF TERMS

For the purposes of this standard, the definitions below apply:

**audit**

a systematic examination against defined criteria to determine whether activities and related results conform to planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve the organisation's policy and objectives (AS 4801 - 2000).

**risk**

the combination of the frequency, or probability of occurrence, and consequence of a specified hazardous event.

**hazard**

a source or a situation with a potential for harm in terms of human injury or ill-health, damage to property, damage to the environment, or a combination of these.

**standard operating procedures (SOP)**

are also known as safe working procedures, safe operating procedures and standard working procedures.

RANGE OF VARIABLES

This competency standard is applicable for those with managerial responsibilities. This may be as a Senior/Specialist Manager or as an owner of a business. These competencies may be applicable in combination with other industries, occupations or workplace specific competencies.
It is to be exhibited in the work area of managerial responsibility which might be an entire enterprise or department of an enterprise.

The competency involves application of relevant legislation and codes of practice, and the maintenance of records, provision of information and dealing with committees, statutory/legal agencies, organisational representatives.

Processes for consultation may include committees, consultation with statutory/legal agencies/site representatives, issue resolution procedures and participative/consultative procedures conducted by supervisory staff within the area of managerial responsibility.

Monitoring of activities may include review of written reports, performance appraisal or auditing procedures.

**Management operates within:**

- an environment ranging from small/medium/large operations
- appropriate policies, guidelines and processes
- established quality and continuous improvement processes
- environmental standards
- ethical standards established by the organisation
- strategic plans developed by the organisation
- productivity and profitability objectives and targets
- international best practice and benchmarking principles and practices
- technical standards established by industry and/or enterprise
- legislation, codes and practices
- resource parameters which may be defined or negotiated
- a diverse range of plant/equipment, products and services.

**Resources may include, but are not limited to:**

- people
- buildings/facilities
- finance
- equipment
- power/energy
- technology
- information
- time.

**Stockpile configurations may include, but are not limited to:**

- access to and from stockpile
- amount to be stored
- edge control
- end use size
- material, size, shape
- method of loading/unloading
- method of storing
- reconciliation of stocks/transfers
- reporting
- safety of area
• segregation
• site modification
• sprinkler systems to keep stockpiles damp to control dust
• stockpile floor
• stockpile identification
• weather conditions.

**Stockpiling requirements may include but are not limited to:**

• surge stocking
• storage bins
• storage of finished products
• loading bay storage.

**Statutory authorities may include, but are not limited to:**

• Mineral Resources or appropriate body
• Safety and Health
• Environmental
• Federal/State/Local Government
• Harbours and Marine
• Port Authority
• Transport Authority
• Company policy and procedures
• Explosives Authority.

**Planning and development would typically include:**

• interpreting and communicating information
• surveying
• infrastructure/technology requirements and would typically incorporate the following specifications:
  - products
  - production rate
  - recyclable materials
  - crushing requirements
  - treatment capacities
  - blending requirements
  - outloading capacity
  - spotting methods
  - hours per week of operation
  - waste and stockpiles
  - water/tailings management
  - transportation systems
• all weather access/haul roads.

**Management interaction/negotiation may be with but is not limited to:**

• stakeholders
• regulatory authorities
• tenderers
operating managers
project managers
contractors
employees
community
suppliers
customers.

**EVIDENCE GUIDE**

1. **Context of Assessment**

   The ultimate competency outcome is for the candidate to be able to establish mine stockpile management systems and, in so doing, to satisfy the performance criteria and underpinning knowledge requirements agreed by the industry in this Competency Unit.

   Mine stockpile management circumstances and requirements will differ markedly between mine sites. Therefore, there are limitations on the extent to which the practical establishment of mine stockpile management systems may be assessed in the workplace. To bridge this potential gap and to ensure the candidate is able to apply the extensive theory to a working situation, assessment is likely to include formal simulation exercises.

   The assessment system for this competency is to cover the following:

   **A.** Theory and knowledge underpinning the competency which is a mandatory requirement

   **B.** Application of theory to a generic practical situation/simulation which is a mandatory requirement

   **OR**

   **C.** Practical establishment of mine stockpile management systems or equivalent activity.

   There are special considerations in respect of Assessment C. It is unlikely that all candidates will be able, in terms of access, reasonable economic constraints and reasonable time frames, to physically establish all systems required at a mine.

   In most cases it would be reasonable to infer competency if a candidate has completed assessments A and B in respect of each required competency and has satisfied assessment C in respect of one of the required systems. This inference is based on the fact that a candidate, who has competently established one system, would be capable of establishing other systems if they have satisfied the theory and generic applications which form part of the required competencies.

   Naturally, if this competency unit is being undertaken as a stand-alone unit rather than as one within a qualification cluster, Assessment C is to be treated as a mandatory requirement.

2. **Inter-dependant Assessment of Units**

   Whilst there are some common features between the units at this level, commonality is generally limited to science and engineering theory and the planning process. This unit requires the specialised application of knowledge. Generalised assessment is unlikely to satisfy the requirements of this unit or of the other allied units.

   Unless inter-dependant assessment can be clearly demonstrated to satisfy the specialised requirements of each subject unit, and do so in a transparent and timely manner, the assessment should be on a unit by unit basis.
This unit covers six primary functions or outcomes being the identification and research of stockpile requirements, design of the stockpile configuration, the selection of equipment, establishing the installation and commissioning procedures, establishing systems for the operation and maintenance and establishing systems for audit and review of stockpile systems and equipment. It therefore represents an activity which may result in a range of other management and technical competencies being invoked.

3. **Critical Aspects of Evidence.** The Industry has established that, for portability purposes, it is essential that competence in this unit reflects successful assessment in the critical aspects of:
   - applying personal, operational safety and health procedures
   - interpreting and communicating information on mine stockpile systems operations
   - identifying hazards and managing risks related to stockpile management
   - applying mine design principles to minimise the likelihood of inappropriate stockpile systems and equipment
   - evaluating and selecting stockpile systems and equipment
   - defining roles and responsibilities for management of stockpile systems
   - establishing the operational and maintenance documentation for stockpile systems and equipment
   - establishing and reviewing statutory reporting procedures
   - establishing and reviewing the training program
   - reviewing and auditing the effectiveness of the stockpile systems and equipment
   - establishing and reviewing stockpile related emergency response procedures.

4. **Consistency of Performance.** Consistency of performance in this unit is aided by the standards of performance, which are contained within State Legislation and by professional standards and practices established and observed by the Industry. Mine stockpile systems and their establishment are to meet Legislative and Industry standards.

**UNDERPINNING KNOWLEDGE**

5. **Underpinning Knowledge.** A knowledge of the listed topics/disciplines in sufficient scope and depth to enable the candidate to establish a mine stockpile management system.

   **A knowledge of:**
   - characteristics, uses and limitations of stockpile equipment
   - computer applications
   - customer/client relations
   - environmental management
   - mine plans
   - mine products
   - mining operations
   - negotiation techniques
   - organisational objectives
   - quality system
   - risk management: principles, strategies and applications
   - safety and health requirements
• statutory control requirement
• stockpile configuration
• stockpile design
• surveying
• team management.

**UNDERPINNING SKILLS**

6. The ability to:
• design and implement stockpile configuration
• monitor and maintain stockpile operations
• manage people and processes
• prepare capital equipment proposals
• analyse and review stockpile operations and costs
• manage projects and tasks
• co-ordinate resources - human, financial and physical
• deliver and maintain services to required specifications
• manage mine traffic
• manage equipment and maintenance systems
• evaluate new and used equipment using appropriate techniques
• control operating costs
• interpret and comply with statutory requirements
• prepare tender specifications
• negotiate and finalise contracts
• access and use appropriate technologies
• prepare and present management reports
• negotiate with internal/external customers, community and statutory/legal authorities
• resolve conflict.

**KEY COMPETENCIES**

<table>
<thead>
<tr>
<th>Key Competency</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collecting, analysing &amp; organising information</td>
<td>1</td>
</tr>
<tr>
<td>Communicating ideas &amp; information</td>
<td></td>
</tr>
<tr>
<td>Planning &amp; organising activities</td>
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<td>Working with others in teams</td>
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<tr>
<td>Using mathematical ideas &amp; techniques</td>
<td></td>
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<tr>
<td>Solving Problems</td>
<td></td>
</tr>
<tr>
<td>Using technology</td>
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</tr>
</tbody>
</table>
**MNIC08A Establish waste and by product management system**

**Description:** This unit covers the use of appropriate measures and criteria to establish waste and by product management systems. Its application provides for the strategic management functions required to develop, establish and maintain waste and by product management systems.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| C8.1 Identify and Research Waste and By Product Requirements. | C8.1.1 Organisation goals, objectives and strategies are analysed.  
C8.1.2 The legislative, statutory and site requirements related to waste and by product management systems are accessed, interpreted and clarified.  
C8.1.3 The requirements for and purpose of waste and by product management systems are identified in accordance with legislative requirements and the system of mining.  
C8.1.4 Strategies, which translate the objectives into the planning process, are developed and implemented. |
| C8.2 Carry Out Environmental Scan. | C8.2.1 Information requirements are established and sources identified and accessed.  
C8.2.2 Strategies and systems are established to support analysis of the environment.  
C8.2.3 The environment is scanned to identify and assess the factors which impact on waste and by product development.  
C8.2.4 Market opportunities are identified and explored to assist the organisation to forecast trends and options.  
C8.2.5 Threats and opportunities are identified, analysed and used to optimise project outcomes.  
C8.2.6 Titles search is undertaken.  
C8.2.7 Legal obligations are identified and documented. |
<table>
<thead>
<tr>
<th>C8.3 Establish Water Recycling Procedures.</th>
<th>C8.3.1</th>
<th>A detailed scoping of the work requirement is conducted and key selection criteria, including hazard identification and risk analysis, is developed.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C8.3.2</td>
<td>Procedures for need, quantity, quality, source and means of treatment of water for production needs are developed.</td>
</tr>
<tr>
<td></td>
<td>C8.3.3</td>
<td>Procedures for water quality and water course groundwater contamination are developed to meet statutory/legal requirements, community objectives and safe responsible work practices.</td>
</tr>
<tr>
<td></td>
<td>C8.3.4</td>
<td>Site treatment works are designed and located for contaminated drainage or development/processing waters, to satisfy relevant statutory/legal requirements.</td>
</tr>
<tr>
<td></td>
<td>C8.3.5</td>
<td>Procedures with appropriate inlet/outlet works and means of improving the natural settlement process are developed and established.</td>
</tr>
<tr>
<td></td>
<td>C8.3.6</td>
<td>Work schedules for operational best practice associated with management systems and water quality specifications are developed.</td>
</tr>
<tr>
<td>C8.4 Establish Tailing Disposal and Water Recycling Operation Procedures.</td>
<td>C8.4.1</td>
<td>A procedure for treated site water reuse to meet environmental and quality standards is developed and established.</td>
</tr>
<tr>
<td></td>
<td>C8.4.2</td>
<td>A program for regular inspections of the water recycling system is developed and established.</td>
</tr>
<tr>
<td></td>
<td>C8.4.3</td>
<td>Procedures for tailings reuse are developed and established to satisfy regulations, environmental criteria and company policies.</td>
</tr>
<tr>
<td>C8.5 Design Dam Systems.</td>
<td>C8.5.1</td>
<td>The requirements for and purpose of dam management systems are identified in accordance with legislative requirements and the system of mining.</td>
</tr>
<tr>
<td></td>
<td>C8.5.2</td>
<td>A specification for the dam management system is developed from a comprehensive analysis of site requirements.</td>
</tr>
<tr>
<td></td>
<td>C8.5.3</td>
<td>Dam de-commissioning procedures are developed in accordance with safe working practices and company policies.</td>
</tr>
</tbody>
</table>
C8.6 Select Equipment for Waste and By Product Management Systems.

C8.6.1 The requirements for and purpose of waste and by product equipment are identified against system requirements.

C8.6.2 A detailed scoping of the work requirement is conducted and key selection criteria, including hazard identification and risk analysis, is developed.

C8.6.3 The requirements for and purpose of waste and by product equipment are identified against systems requirements.

C8.6.4 A specification for the required waste and by product equipment is developed.

C8.6.5 The preferred equipment solutions are selected on the basis of performance against specification requirements.

C8.7 Establish Installation and Commissioning Procedures.

C8.7.1 A procedure to identify hazards and analyse and evaluate risks associated with the installation of waste and by product systems and equipment is established.

C8.7.2 Integration of new and existing systems and processes is planned and prepared for to achieve optimum performance.

C8.7.3 Safe operating procedures and rules are developed from a detailed analysis of site requirements.

C8.7.4 Procedures for installing and commissioning waste and by product systems and equipment are developed and established.

C8.7.5 A program, including systems and procedures, to satisfy identified waste and by product training requirements is established.

C8.7.6 Emergency response and evacuation systems, plans and procedures are established in accordance with site requirements.

C8.8 Establish Systems for the Operation and Maintenance of Waste and By Product Management Systems

C8.8.1 Operational procedures for waste and by product systems and equipment, are developed from site and legislative requirements and incorporated into site documentation.
C8.8.2 Maintenance procedures for waste and by product systems and equipment are developed from site and legislative requirements and incorporated into site documentation.

C8.8.3 Procedures for reviewing and modifying work processes are developed and established.

C8.9.1 Procedures to evaluate and confirm system/equipment compliance with statutory and site requirements are established.

C8.9.2 Future waste and by product systems and equipment requirements are identified, assessed and incorporated into planning processes.

C8.9.3 Procedures to confirm the currency and compliance of waste and by product maintenance and safety standards are established.

C8.9.4 The system for recording and reporting of waste and by product and equipment information is established.

C8.9.5 The waste and by product training program is audited for currency and relevance.

C8.9.6 Procedures for incorporating feedback into the audit/review system is established.

C8.9.7 Emergency response and evacuation systems, plans and procedures are audited for compliance with site requirements.

C8.9.8 Procedures for response to instances of non-compliance or other discrepancies/deficiencies revealed by audit are established.

**DEFINITION OF TERMS**

For the purposes of this standard, the definitions below apply:

**audit**

a systematic examination against defined criteria to determine whether activities and related results conform to planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve the organisation's policy and objectives.
risk | the combination of the frequency, or probability of occurrence, and consequence of a specified hazardous event.

hazard | a source or a situation with a potential for harm in terms of human injury or ill-health, damage to property, damage to the environment, or a combination of these.

standard operating procedures (SOP) | are also known as safe working procedures, safe operating procedures and standard working procedures.

**RANGE OF VARIABLES**

This competency standard is applicable for those with managerial responsibilities. This may be as a Senior/Specialist Manager or as an owner of a business. These competencies may be applicable in combination with other industries, occupations or workplace specific competencies.

It is to be exhibited in the work area of managerial responsibility which might be an entire enterprise or department of an enterprise.

The competency involves application of relevant legislation and codes of practice, and the maintenance of records, provision of information and dealing with committees, statutory/legal agencies, organisational representatives.

Processes for consultation may include committees, consultation with statutory/legal agencies/site representatives, issue resolution procedures and participative/consultative procedures conducted by supervisory staff within the area of managerial responsibility.

Monitoring of activities may include review of written reports, performance appraisal or auditing procedures.

**Management operates within:**
- a diverse range of plant/equipment, products and services
- an environment ranging from small/medium/large operations
- appropriate policies, guidelines and processes
- business and performance plans
- enterprise/industrial agreements/awards
- environmental standards
- established quality and continuous improvement processes
- ethical standards established by the organisation
- human resource practices and policies
- international best practice and benchmarking principles and practices
- learning organisation principles and practices
- legislation, codes and practices
- productivity and profitability objectives and targets
- resource parameters which may be defined or negotiated
- strategic plans developed by the organisation
• technical standards established by industry and/or enterprise
• training and development systems.

Management is responsible for but is not limited to:
• evaluating equipment/plant and power requirements for quarry operations
• planning and monitoring earth work operations
• monitoring project timeframes against budget
• developing detailed site plans and working drawings
• establishing a rehabilitation plan in line with regulative requirements
• establishing and managing positive relations with others in the internal and external environment
• research which could include:
  – geological, climatic, hydrology/topography and environmental factors
  – cultural and biological environments
• influence operational performance
• records/reports
  – oral/written/computer based
• supervision of maintenance.

Management must comply with statutory/legal requirements. These may include:
• boundaries, leases and tenements
• by-laws
• contamination
• council
• dangerous goods
• environmental - noise/air/water
• explosives
• freehold
• mine safety and health
• rehabilitation
• royalties
• wildlife corridors.

Planning and development would typically include:
• interpreting and communicating information
• surveying
• infrastructure/technology requirements and would typically incorporate the following specifications:
  – products
  – production rate
  – recyclable materials
  – stack emissions
  – treatment methods
  – flow requirements
  – reticulation options
  – pumping requirements
  – storage/holding capacities
  – hours per week of operation
  – waste and stockpiles
  – water/tailings management
  – transportation systems.

Statutory authorities may include, but are not limited to:
• Mineral Resources or appropriate body
• Safety and Health Authority
• Environmental
• Federal/State/Local Government
• Harbours and Marine
• Port Authority
• Road Authority.
Management interaction/negotiation may be with but is not limited to:
- stakeholders
- regulatory authorities
- tenderers
- operating managers
- project managers
- contractors
- employees
- community
- suppliers
- customers.

Resources may include, but are not limited to:
- people, information and time
- buildings/facilities
- finance
- equipment
- power/energy
- technology.

**EVIDENCE GUIDE**

1. **Context of Assessment**

The ultimate competency outcome is for the candidate to be able to establish waste and by-product management systems and, in so doing, to satisfy the performance criteria and underpinning knowledge requirements agreed by the industry in this Competency Unit.

Mine waste and by-product management circumstances and requirements will differ markedly between mine sites. Therefore, there are limitations on the extent to which the practical establishment of waste and by-product management systems may be assessed in the workplace. To bridge this potential gap and to ensure the candidate is able to apply the extensive theory to a working situation, assessment is likely to include formal simulation exercises.

The assessment system for this competency is to cover the following:

A. Theory and knowledge underpinning the competency which is a mandatory requirement

B. Application of theory to a generic practical situation/simulation which is a mandatory requirement

OR

C. Practical establishment of mine waste and by-product management systems or equivalent activity.
There are special considerations in respect of Assessment C. It is unlikely that all candidates will be able, in terms of access, reasonable economic constraints and reasonable time frames, to physically establish all the required mine systems.
In most cases it would be reasonable to infer competency if a candidate has completed assessments A and B in respect of each required competency and has satisfied assessment C in respect of one of the required systems. This inference is based on the fact that a candidate, who has competently established one system, would be capable of establishing other systems if they have satisfied the theory and generic applications which form part of the required competencies.

Naturally, if this competency unit is being undertaken as a stand-alone unit rather than as one within a qualification cluster, Assessment C is to be treated as a mandatory requirement.

2. **Inter-dependent Assessment of Units**

   Whilst there are some common features between the units at this level, commonality is generally limited to science and engineering theory and the planning process. This unit requires the specialised application of knowledge. Generalised assessment is unlikely to satisfy the requirements of this unit or of the other allied units.

   Where inter-dependent assessment can be clearly demonstrated to satisfy the specialised requirements of each subject unit, and do so in a transparent and timely manner, the assessment may be on an holistic basis. This may be the case in relation to Unit MNIC6A, Establish the Mine Water Management System.

   This unit covers nine primary functions or outcomes being the identification and research of waste and by product requirements, carrying out an environmental scan, establishing water recycling procedures, establishing tailing disposal and water recycling operating procedures, the design of dam systems, the selection of equipment for waste and by product systems, establishing installation and commissioning procedures, establishing systems for the operation and maintenance, and establishing audit and review systems for waste and by products. It therefore represents an activity which may result in a range of other management and technical competencies being invoked.

3. **Critical Aspects of Evidence.** The Industry has established that, for portability purposes, it is essential that competence in this unit reflects successful assessment in the critical aspects of:

   - applying personal, operational safety and health procedures
   - interpreting and communicating information on mine waste and by product systems operations
   - identifying hazards and managing risks related to waste and by-product management systems
   - applying mine design principles to minimise the likelihood of inappropriate waste and by product systems and equipment
   - evaluating and selecting waste and by product systems and equipment
   - defining roles and responsibilities for management of waste and by product systems and equipment
   - establishing the operational and maintenance documentation for waste and by product systems and equipment
   - establishing and reviewing statutory reporting procedures
   - establishing and reviewing the training program
• reviewing and auditing the effectiveness of the waste and by product systems and equipment
• establishing and reviewing waste management related emergency response procedures.
4. **Consistency of Performance.** Consistency of performance in this unit is aided by the standards of performance, which are contained within State Legislation and by professional standards and practices established and observed by the Industry. Mine waste and by product systems and their establishment are to meet Legislative and Industry standards.

**UNDERPINNING KNOWLEDGE**

5. **Underpinning Knowledge.** A knowledge of the listed topics/disciplines in sufficient scope and depth to enable the candidate to establish the mine waste and by product management systems.

A knowledge of:

- computer applications
- customer/client relations
- dam design and construction
- emergency response and disaster planning
- environmental management
- financial management
- mine plans
- mine products and services
- mining operations
- negotiation techniques
- organisational objectives
- quality system
- risk management: principles, strategies and applications
- safety and health requirements
- statutory control requirements
- surveying
- team management
- training and assessment systems
- water recycling

**UNDERPINNING SKILLS**

6. **The ability to:**

- access and use appropriate information management technologies
- analyse and review waste management systems
- audit waste management performance - energy, safety, environment, quality assurance, legislative compliance
- control operating costs
- co-ordinate resources - human, financial and physical
- deliver and maintain services to required specifications
- develop business/resource plans
- evaluate new and used equipment using appropriate techniques
• gain statutory/legal approvals
• implement change
• manage equipment and maintenance systems
UNDERPINNING SKILLS ... Continued…

- manage people and processes
- manage projects and tasks
- monitor and maintain waste management systems
- negotiate and finalise contracts
- negotiate with internal/external customers, community and statutory/legal authorities
- prepare and present management reports
- prepare operating budgets
- prepare tender specifications
- resolve conflict.

KEY COMPETENCIES

<table>
<thead>
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<th>Key Competency</th>
<th>Level</th>
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<td>Using technology</td>
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</tbody>
</table>
**MNIC09A Establish and manage the mine occupational health and safety system**

**Description:** This unit covers the establishment and management of the occupational health and safety system. Its application is to ensure the workplace is, so far as is reasonably achievable, safe and without risks to the health of employees. The safety system may also be known as the Safety and Health Management System.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>C9.1.1</td>
<td>Occupational health and safety policies are developed which clearly express the enterprise's commitment with respect to occupational health and safety within the area of managerial responsibility, and how relevant occupational health and safety legislation will be implemented, consistent with overall organisational policies.</td>
</tr>
<tr>
<td>C9.1.2</td>
<td>Occupational health and safety responsibilities and duties, which will allow implementation and integration of the occupational health and safety systems, are clearly defined, allocated and included in job descriptions and duty statements for all relevant positions.</td>
</tr>
<tr>
<td>C9.1.3</td>
<td>Financial and human resources for the operation of the occupational health and safety system are identified, sought and/or provided in a timely and consistent manner.</td>
</tr>
<tr>
<td>C9.1.4</td>
<td>Information on the occupational health and safety system, and procedures for the area of responsibility, is provided and explained in a form which is readily accessible to employees.</td>
</tr>
<tr>
<td>C9.2.1</td>
<td>Appropriate consultative processes are established and maintained in consultation with employees and their representatives in accordance with relevant occupational health and safety legislation and consistent with the organisation's overall process for consultation.</td>
</tr>
<tr>
<td>C9.2.2</td>
<td>Issues raised through participation and consultation are dealt with and resolved</td>
</tr>
</tbody>
</table>
promptly and effectively in accordance with procedures for issue resolution.

C9.2.3 Information about the outcomes of participation and consultation is provided in a manner accessible to employees.

C9.3 Establish and Maintain Procedures for Identifying Hazards.

C9.3.1 Existing and potential hazards within the area of managerial responsibility are correctly identified and identification confirmed in accordance with occupational health and safety legislation, codes of practice and trends identified from the occupational health and safety records system.

C9.3.2 A procedure for ongoing identification of hazards is developed and integrated within systems of work and procedures.

C9.3.3 Activities are appropriately monitored to ensure that this procedure is adopted effectively throughout the area of managerial responsibility.

C9.3.4 Hazard identification is addressed at the planning, design and evaluation stages of any change in the workplace to ensure that new hazards are not created.

C9.4 Establish and Maintain Procedures for Assessing Risk.

C9.4.1 Risks presented by identified hazards are correctly assessed in accordance with the occupational health and safety legislation and codes of practice.

C9.4.2 A procedure for ongoing assessment of risks is developed and integrated within systems of work and procedures.

C9.4.3 Activities are monitored to ensure that this procedure is adopted effectively throughout the area of managerial responsibility.

C9.4.4 Risk assessment is addressed at the planning, design and evaluation stages of any change within the area of managerial responsibility to ensure that the risk from hazards is not increased.

C9.5 Establish and Maintain Procedures for Treating

C9.5.1 Measures to control assessed risks are developed and implemented in accordance with, relevant
Risks. occupational health and safety legislation, codes of practice and trends identified from the occupational health and safety records system.

C9.5.2 When measures which treat a risk at its source are not immediately practicable, interim solutions are implemented until a permanent control measure is developed.

C9.5.3 A procedure for ongoing control of risks is developed and integrated within general systems of work and procedures.

C9.5.4 Activities are monitored to ensure that the risk treatment procedure is adopted effectively throughout the area of managerial responsibility.

C9.5.5 Risk treatment is addressed at the planning, design and evaluation stages of any change within the area of managerial responsibility to ensure that adequate risk control measures are included.

C9.5.6 Inadequacies in existing risk treatment measures are identified and resources enabling implementation of new measures are sought and/or provided according to appropriate procedures.

C9.6 Establish and Maintain Organisational Procedures for Dealing with Unplanned Incidents.

C9.6.1 The range of most likely potential unplanned incidents are correctly identified from an analysis of likely risks.

C9.6.2 Procedures, which would treat the risks associated with the events and meet any legislative requirements are, as a minimum, developed in consultation with appropriate emergency services.

C9.6.3 Appropriate information and training is provided to all employees to enable implementation of the correct procedures in all relevant circumstances.

C9.7 Establish and Maintain an Occupational Health and Safety Training

C9.7.1 An occupational health and safety training program is developed and implemented to identify and fulfil employees' occupational
C9.8 Establish and Maintain a System for Occupational Health and Safety Records.

C9.8.1 A system for keeping occupational health and safety records is established and monitored to allow identification of patterns of occupational injury and disease within the area of managerial responsibility.

C9.9 Evaluate the Organisation's Occupational Health and Safety System and Related Policies, Procedures and Programs.

C9.9.1 The effectiveness of the mine's occupational health and safety system and related policies, procedures and programs is assessed in accordance with the organisation's goals and objectives and statutory requirements.

C9.9.2 Improvements to the occupational health and safety system are developed and implemented to ensure more effective achievement of the organisation's aims with respect to occupational health and safety.

C9.9.3 Compliance with occupational health and safety legislation and codes of practice is assessed to ensure that legal occupational health and safety standards are maintained as a minimum.

DEFINITION OF TERMS

For purposes of consistency, the following definitions have been applied in this standard.

**audit**
a systematic examination against defined criteria to determine whether activities and related results conform to planned arrangements and whether these arrangement are implemented effectively and are suitable to achieve the organisation's policy and objectives

**advice and support**
providing direct advice, referring people to other sources of knowledge and expertise, giving hands-on assistance and providing suitable development activities

**authority**
the power to achieve delegated objectives within an agreed framework

**continual improvement**
process of enhancing the occupational health and safety management system, to achieve improvements in overall occupational health and safety performance, in line with the organisation's OH&S policy
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>hazard</td>
<td>a source or a situation with a potential for harm in terms of human injury or ill-health, damage to property, damage to the environment, or a combination of these</td>
</tr>
<tr>
<td>hazard identification</td>
<td>the process of recognising that a hazard exists and defining its characteristics</td>
</tr>
<tr>
<td>health surveillance</td>
<td>monitoring of individuals for the purpose of identifying changes in health status due to occupational exposure to a hazard. It includes biological monitoring</td>
</tr>
<tr>
<td>incident</td>
<td>any unplanned event resulting in, or having a potential for injury, ill-health, damage or other loss</td>
</tr>
<tr>
<td>occupational health and safety management system (OHSMS)</td>
<td>that part of the overall management system which includes organisational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the OHS policy, and so managing the OHS risks associated with the business of the organisation</td>
</tr>
<tr>
<td>occupational health and safety objectives</td>
<td>goals in terms of OHS performance, arising from the occupational health and safety policy that an organisation sets itself to achieve, and which are quantified where practicable</td>
</tr>
<tr>
<td>occupational health and safety policy</td>
<td>statement by the organisation of its intentions and principles in relation to its overall occupational health and safety performance which provides a framework for action and for the setting of its occupational health and safety objectives and targets</td>
</tr>
<tr>
<td>occupational health and safety professional</td>
<td>a person with expertise and qualifications in the identification, assessment, evaluation or control of occupational risks, hazards or occupational ill-health</td>
</tr>
<tr>
<td>rehabilitation</td>
<td>the managed process of maintaining injured or ill employees in, or returning them to, suitable employment</td>
</tr>
<tr>
<td>responsibility</td>
<td>being accountable for the achievement of objectives</td>
</tr>
<tr>
<td>risk</td>
<td>the combination of the frequency, or probability of occurrence, and consequence of a specified hazardous event</td>
</tr>
<tr>
<td>safety</td>
<td>a state in which the risk of harm (to persons) or damage is limited to an acceptable level</td>
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</tbody>
</table>
This unit describes generic occupational health and safety competencies applicable for those with managerial responsibilities.

It is to be exhibited in the work area of responsibility which would typically be a mine site.

The competency involves application of relevant occupational health and safety legislation, codes of practice and guidelines particularly general duty of care requirements for the maintenance of records of occupational injury and disease, provision of information and training, and that dealing with occupational health and safety committees, health and safety representatives and issue resolution.

**Occupational health and safety management system principles are to include:**

- commitment and policy
- planning
- implementation
- measurement and evaluation
- review and improvement.

Processes for consultation may include occupational health and safety committees, consultation with health and safety representatives, issue resolution procedures and participative/consultative procedures conducted by supervisory staff within the area of managerial responsibility.

Monitoring of activities may include review of written reports, performance appraisal or auditing procedures.

Relevant positions for implementing the occupational health and safety system will include managers, supervisors, occupational health and safety officer/manager and first aid officers.

**Statutory/legal compliance may include but is not limited to:**

- trade practices
- weights and measures
- waterways
- workers compensation/workcover
- planning and assessment
- local government
- dangerous goods
- industry licensing
- industrial relations
- navigation
- mines act
- common law
- development of training policies/programs to aid compliance.

**Actions are to be in accordance with all relevant statutory/legal requirements, particularly:**

- requirements for the maintenance of records for statutory/legal breaches
- provision of information and training
- regulations and codes of practice relating to statutory/legal compliance
- site representatives and committees
- issue resolution.
Management operates within:
- work schedules may include shift work and varying hours of duty
- environments ranging from simple to complex and diverse
- appropriate policies, guidelines and processes
- a level of autonomy which may range from limited to substantial
- quality and continuous improvement processes and standards
- business and performance plans
- ethical standards established by the organisation
- productivity and profitability objectives and targets
- best practice and benchmarking principles and practices
- legislation, codes and practices
- resource parameters which may be defined or negotiated
- training and development principles and practices
- human resource policies and practices including interviewing, counselling, dispute settling and discipline
- enterprise/industrial agreements/awards.

Resources may include, but are not limited to:
- people
- finance
- equipment
- environment
- buildings/facilities
- technology
- information.

Negotiations may be with a variety of internal or external sources and be:
- formal or informal
- short term or ongoing
- multi-lingual and cross-cultural
- enterprise agreements
- legislation regulation compliance and include relative authorities, project managers, employees, contractors, customers and the community.

Legislative compliance will typically involve:
- mines department/mineral resources or appropriate body
- safety and health legislative body
- environmental authority
- state/federal/local government authorities
- emergency services.

**EVIDENCE GUIDE**

This guideline is to assist the development of assessment instruments/tools to assess the competence of mining managers. At this level, mining managers must provide evidence of consistent achievement of this Unit's workplace outcomes.

1. **Context of Assessment**
The ultimate competency outcome is for the candidate to be able to establish and manage a mine occupational health and safety system and, in so doing, to satisfy the performance criteria and underpinning knowledge requirements agreed by the industry in this Competency Unit.

Mine occupational health and safety circumstances and requirements will differ markedly between mine sites. Therefore, there are limitations on the extent to which the practical establishment and management of the occupational health and safety system may be assessed in the workplace. To bridge this potential gap and to ensure the candidate is able to apply the extensive theory to a working situation, assessment is likely to include formal simulation exercises.

The assessment system for this competency is to cover the following:

A. Theory and knowledge underpinning the competency which is a mandatory requirement

B. Application of theory to a generic practical situation/simulation which is a mandatory requirement

OR

C. Practical establishment and management of an occupational health and safety system or equivalent activity.

There are special considerations in respect of Assessment C. It is unlikely that all candidates will be able, in terms of access, reasonable economic constraints and reasonable time frames, to physically establish all the required mine systems.

In most cases it would be reasonable to infer competency if a candidate has completed assessments A and B in respect of each required competency and has satisfied assessment C in respect of this competency or has completed the conduct of a formal audit/review of an existing and significant mine occupational health and safety system.

2. Interdependent Assessment of Units

Whilst there are some common features between the units at this level, commonality is generally limited to science and engineering theory and the planning process. This unit requires the specialised application of knowledge. Generalised assessment is unlikely to satisfy the requirements of this unit or of the other allied units.

Where interdependent assessment can be clearly demonstrated to satisfy the specialised requirements of each subject unit, and do so in a transparent and timely manner, the assessment may be on a unit by unit basis.

This unit covers nine primary functions or outcomes for the establishment, maintenance and improvement of the Occupational Health and Safety System. The nine primary functions or outcomes include establishing and maintaining the framework, establishing and maintaining participative arrangements, establishing and maintaining procedures for identifying hazards, establishing and maintaining procedures for assessing risks, establishing and maintaining procedures for controlling risks, establishing and maintaining enterprise procedures for dealing with hazardous events, establishing and
maintaining an occupational health and safety training program, establishing and maintaining a system for occupational health and safety records and evaluating the enterprise occupational health and safety system and related policies, procedures and programs. It therefore represents activities which may result in a range of other management and technical competencies being invoked.

For these reasons, it would be normal for the assessment of this unit to be handled as an individual entity.

3. **Critical Aspects of Evidence.** The Industry has established that, for portability purposes, it is essential that competency in this unit reflects successful assessment in the critical aspects of behaviours and outcomes which require the candidate to:

- applying personal and operational safety and health procedures
- interpreting and communicating information on health and safety management
- establishing the occupational health and safety system
- integrating the occupational health and safety system with other management systems
- defining roles and responsibilities for system management
- establishing and reviewing statutory reporting procedures
- establishing and reviewing the competency training programs
- monitoring the implementation of the system
- auditing and reviewing the effectiveness of the mine occupational health and safety systems
- applying continuous improvement processes.

4. **Consistency of Performance.** Consistency of performance in this unit is aided by the standards of performance which are contained within State Legislation and by professional standards and practices established and observed by the Industry.
5. A knowledge of the listed topics/disciplines in sufficient scope and depth to enable the candidate to establish and manage the mine occupational health and safety system.

A knowledge of:

- occupational health and safety legislation, policies and codes of practice
- occupational health and safety auditing
- statutory/legal control
- duty of care
- training design and management
- emergency procedures
- strategic planning
- human resource management
- statutory and site rules, policies, procedures and regulations
- risk management processes and techniques
- action planning methods
- continuous improvement processes
- company policy.

6. The ability to:

- access and analyse archival and historical information related to the mine safety matters
- access, interpret and apply technical occupational health and safety information
- apply and manage research techniques and activities
- audit occupational health and safety systems and recommend strategies for improvement
- communicate effectively in the workplace
- develop and introduce practices to improve the work environment
- develop and maintain risk management procedures and policies
- develop and maintain statutory/legal and organisational policies and procedures
- explain complex information to superiors/subordinates
- maintain relevant records and documents
- monitor and decide on changes to process
- provide coaching and mentoring support
- take a leading role in initiating action and making decisions
- use effective consultative mechanisms to negotiate processes and procedures appropriate to workplace safety.

Key Competencies

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<tr>
<th>Key Competency</th>
<th>Level</th>
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<tr>
<td>Skill/Activity</td>
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<tr>
<td>Collecting, analysing &amp; organising information</td>
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<tr>
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<tr>
<td>Working with others in teams</td>
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<tr>
<td>Using mathematical ideas &amp; techniques</td>
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<tr>
<td>Solving Problems</td>
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<td>Using technology</td>
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Establish the mine emergency systems

Description: This unit covers the use of appropriate measures and criteria to establish the mine emergency systems.

Its application provides for the strategic management functions required to develop and establish the mine emergency systems.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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<tbody>
<tr>
<td>C10.1</td>
<td>Establish Mine</td>
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<tr>
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<td>Emergency Systems</td>
</tr>
<tr>
<td>C10.1.1</td>
<td>The legislative, statutory and site requirements related to mine emergency systems are accessed, interpreted and clarified.</td>
</tr>
<tr>
<td>C10.1.2</td>
<td>The requirements for and purpose of mine emergency systems are identified in accordance with legislative and site requirements.</td>
</tr>
<tr>
<td>C10.1.3</td>
<td>The emergency plan is designed and developed from an analysis of all relevant technical and operational information.</td>
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<tr>
<td>C10.1.4</td>
<td>An organisational structure for the management of emergency is designed and developed from an analysis of all relevant technical and operational information.</td>
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<tr>
<td>C10.1.5</td>
<td>Emergency procedures for management of classes of incident are developed from an analysis of all relevant technical and operational information.</td>
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<tr>
<td>C10.1.6</td>
<td>Emergency procedures for management of decision making processes and decision monitoring systems are established.</td>
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<td>C10.1.7</td>
<td>The plan is reviewed with relevant stakeholders and specialists.</td>
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<tr>
<td>C10.1.8</td>
<td>A program, including systems and procedures, to satisfy identified mine emergency training requirements is established.</td>
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<tr>
<td>C10.1.9</td>
<td>Procedures to audit and review mine emergency compliance with statutory and site requirements are established.</td>
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<tr>
<td>C10.1.10</td>
<td>Procedures for incorporating feedback into the audit/review system are established.</td>
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<tr>
<td>C10.2</td>
<td>Establish Mine Emergency Facilities, Equipment and Personnel.</td>
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<td>C10.2.1</td>
<td>Incident information receipt and recording systems are established in accordance with statutory and site requirements.</td>
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<tr>
<td>C10.2.2</td>
<td>Emergency and evacuation plans and procedures are established in accordance with statutory and site requirements.</td>
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<tr>
<td>C10.2.3</td>
<td>Operations facilities, including communications to support them, are established in accordance with the emergency plan.</td>
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<tr>
<td>C10.2.4</td>
<td>Action planning processes to manage the situation/incident are developed in accordance with the emergency plan.</td>
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<tr>
<td>C10.2.5</td>
<td>Required services, personnel, equipment and resources for types of incidents are identified in accordance with the emergency plan.</td>
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<tr>
<td>C10.2.6</td>
<td>Documentation and reporting requirements are determined and established in accordance with statutory and site requirements.</td>
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<tr>
<td>C10.3</td>
<td>Establish Post-Incident Management Procedures.</td>
</tr>
<tr>
<td>C10.3.1</td>
<td>Plans to manage post-incident actions are established in accordance with statutory and site requirements.</td>
</tr>
<tr>
<td>C10.3.2</td>
<td>Processes to investigate nature and cause of situation/incident are determined and established in accordance with statutory and site requirements.</td>
</tr>
<tr>
<td>C10.3.3</td>
<td>Processes to evaluate the effectiveness of emergency and action plans to achieve objectives are determined and established in accordance with statutory and site requirements.</td>
</tr>
<tr>
<td>C10.4</td>
<td>Audit And Review the Emergency Plan.</td>
</tr>
<tr>
<td>C10.4.1</td>
<td>Emergency monitoring systems are audited for compliance with statutory and management plan standards.</td>
</tr>
<tr>
<td>C10.4.2</td>
<td>Emergency processes are audited for compliance with statutory and mine site requirements.</td>
</tr>
<tr>
<td>C10.4.3</td>
<td>Recording systems are audited for compliance with the emergency plan.</td>
</tr>
<tr>
<td>C10.4.4</td>
<td>Emergency maintenance program and procedures are implemented in accordance with</td>
</tr>
</tbody>
</table>
C10.4.5 Emergency training program is audited for currency, relevance and compliance with the requirements of the plan.

C10.4.6 Instances of non-compliance or other discrepancies/deficiencies revealed by audit are responded to promptly and the emergency plan is modified accordingly.

C10.5 Plan And Prepare for the Implementation of the Emergency Plans.

C10.5.1 The legislative, statutory and site requirements related to emergency management are identified and interpreted.

C10.5.2 The emergency plans are accessed, interpreted and clarified.

C10.5.3 Roles and responsibilities, as specified in the emergency plans, are identified, clarified and communicated to all persons.

C10.5.4 Resources required for the implementation of the emergency plans are identified, forecast, obtained and allocated/scheduled.

C10.5.5 The emergency training program is implemented.

C10.5.6 Suggestions and recommendations for changes to emergency implementation procedures are encouraged, received, reviewed and, where appropriate, implemented.

**DEFINITION OF TERMS**

**Audit**
A systematic examination against defined criteria to determine whether activities and related results conform to planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve the organisation's policy and objectives.

**Consequence**
The outcome of an event or situation expressed qualitatively or quantitatively, being a loss, injury, disadvantage or gain.

**Cost**
Of activities, both direct and indirect, involving any negative impact, including money, time, labour, disruption, goodwill, political and intangible losses.

**Frequency**
A measure of likelihood expressed as the number of occurrences of an event in a given time.
hazard
a source or a situation with a potential for harm in terms of human injury or ill-health, damage to property, damage to the environment, or a combination of these.

hazard identification
the process of recognising that a hazard exists and defining its characteristics.

likelihood
used as a qualitative description of probability and frequency.

loss
any negative consequence, financial or otherwise.

monitor
to check, supervise, observe critically, or record the progress of an activity, action or system on a regular basis in order to identify change.

probability
the likelihood of a specific outcome, measured by the ratio of specific outcomes to the total number of possible outcomes. Probability is expressed as a number between 0 and 1, with 0 indicating an impossible outcome and 1 indicating an outcome is certain.

risk
the combination of the frequency, or probability of occurrence, and consequence of a specified hazardous event.

risk acceptance
an informed decision to accept the likelihood and the consequences of a particular risk.

risk analysis
a systematic use of available information to determine how often specified events may occur and the magnitude of their likely consequences.

risk assessment
the overall process of estimating the magnitude of risk and deciding what actions will be taken.

standard operating procedures (SOP)
are also known as safe working procedures, safe operating procedures and standard working procedures.

post-incident management
is the control of activities arising from an incident and can include: legal advice, environmental aspects, critical incident stress debriefing, interviewing, investigations, witness interview statements, restoration of normal operations, media releases, public relations, employee welfare and family support, security of evidence, liaison with statutory/legal bodies, statutory investigations, review of emergency procedures, documentation of ongoing operations, restoration of emergency preparedness.

RANGE OF VARIABLES
This competency standard is applicable for those with managerial responsibilities. This may be as a Senior/Specialist Manager or as an owner of a business. These competencies may be applicable in combination with other industries, occupations or workplace specific competencies.

It is to be exhibited in the work area of managerial responsibility which might be an entire enterprise or department of an enterprise.

The competency involves application of relevant legislation and codes of practice, and the maintenance of records, provision of information and dealing with committees, statutory/legal agencies and organisational representatives.

Processes for consultation may include committees, consultation with statutory/legal agencies/site representatives, issue resolution procedures and participative/consultative procedures conducted by supervisory staff within the area of managerial responsibility.

Monitoring of activities may include review of written reports, performance appraisal or auditing procedures.

**Types of incident can be identified as, but not limited to:**
- chemical injury
- entrapment
- equipment damage
- fire
- fugitive chemicals
- inundation
- irrespirable atmosphere
- personnel injury or death
- rock fall
- unscheduled explosion.

**Incidents can be caused by, but are not limited to:**
- aircraft accident
- bulk-head collapse
- explosives
- flammable solids or liquids
- hazchem
- inrush
- mining induced subsidence
- outburst
- release of stored energy
- seismic event
- sulphide dust explosion
- vehicle accidents
- vehicle fire.

**Stakeholders and other consulting partners can include, but are not limited to:**
- ambulance
- board of directors
- contractors
• critical incident stress debriefing organisations
• customers
• emergency management and assistance organisations
• employee representatives
• employees
• families
• fire brigade
• government mining authorities
• hospital
• insurance companies
• local community
• local government
• manufacturers
• medical staff
• mines rescue services
• Police
• specialist professionals
• suppliers.

Required services and resources can include, but are not limited to:
• internal mine services and resources
• contractors
• suppliers
• local community
• manufacturers
• inspectorate
• police
• mines rescue services
• fire brigade
• ambulance
• medical staff
• hospital
• critical incident stress debriefing organisations
• local emergency management organisations
• local government
• media
• coroner's representative
• security services
• solicitors
• workers representatives
• other mines
• experts such as engineers, scientists
• down-hole camera
• drill rigs
• forensic.

Communications can include:
• radio
• telephone
• telemetry
• verbal
• written
• computers
• runners
• mirrors
• signals
• stench gas
• alarms/sirens.

**Equipment refers to that needed to control the incident and includes but is not restricted to:**
• rescue equipment
• mining equipment
• transport
• specialised equipment from external sources
• monitoring and analysis equipment
• breathing apparatus.

**Media can include:**
• radio
• print media
• television.

**Operations facilities are those which are set up to manage an incident and can include, but are not restricted to:**
• operations centre
• press room
• mortuary
• muster areas
• meeting rooms
• communications centres and networks.

**Future operations can include, but are not restricted to:**
• sealing mine areas
• restoration to full production
• suspension of operations
• full closure of mine.

**Statutory/legal compliance may include but is not limited to:**
• common law
• coroner
• dangerous goods
• development of training policies/programs to aid compliance
• emergency services
• environmental
• explosives
• gas and petroleum
industrial relations
local government
minerals and extractive industry licensing
mines act
navigation
planning and assessment
road traffic
safety and health
trade practices
waterways
weights and measures
workers compensation/workcover.

Actions are to be in accordance with all relevant statutory/legal requirements, particularly:

- requirements for the maintenance of records for statutory/legal breaches
- provision of information and training
- regulations, codes of practice and guidelines relating to statutory/legal compliance
- site representatives and committees
- issue resolution.

Negotiations may be with a variety of internal or external sources and be:

- formal or informal
- short term or ongoing
- multi-lingual and cross-cultural
- enterprise agreements
- legislation regulation compliance

and include relative authorities, project managers, employees, contractors, customers and the community.

**EVIDENCE GUIDE**

1. **Context of Assessment**

   The ultimate competency outcome is for the candidate to be able to establish mine emergency systems and, in so doing, to satisfy the performance criteria and underpinning knowledge requirements agreed by the industry in this Competency Unit.

   Mine emergency systems circumstances and requirements will differ markedly between mine sites. Therefore, there are limitations on the extent to which the practical establishment of mine emergency systems may be assessed in the workplace. To bridge this potential gap and to ensure the candidate is able to apply the extensive theory to a working situation, assessment is likely to include formal simulation exercises.

   The assessment system for this competency is to cover the following:

   A. Theory and knowledge underpinning the competency which is a mandatory requirement

   B. Application of theory to a generic practical situation/simulation which is a mandatory requirement
OR

C. Practical establishment of mine emergency systems or equivalent activity.

In most cases it would be reasonable to infer competency if a candidate has completed assessments A and B in respect of each required competency and has satisfied assessment C in respect of this competency or has completed the conduct of a formal audit/review of an existing mine emergency system.

2. Inter-dependent Assessment of Units

Whilst there are some common features between the units at this level, commonality is generally limited to science and engineering theory and the planning process. This unit requires the specialised application of knowledge. Generalised assessment is unlikely to satisfy the requirements of this unit or of the other allied units.

Unless inter-dependant assessment can be clearly demonstrated to satisfy the specialised requirements of each subject unit, and do so in a transparent and timely manner, the assessment should be on a unit by unit basis.

This unit covers a range of functions or outcomes being the establishment of the mine emergency systems, the mine emergency facilities, equipment and personnel, the post-incident management procedures, the audit and review of the emergency plan and the planning and preparation for the implementation of the emergency plans. It therefore represents an analysis activity that may result in a range of other management and technical competencies being invoked.

3. Critical Aspects of Evidence. The Industry has established that, for portability purposes, it is essential that competence in this unit reflects successful assessment in the critical aspects of:

- emergency planning for mines
- development of emergency procedures for management of different classes of incident
- the roles of stakeholders and specialists at incidents
- the structure and roles of on-site functions and personnel
- information gathering, analysis and communication
- action plan development and evaluation
- establishment of incident operations facilities
- incident management planning
- post-incident management planning
- auditing and reviewing emergency plans
- establishing the training component of the emergency plan.

4. Consistency of Performance. Consistency of performance in this unit is aided by the standards of performance which are contained within State Legislation and by professional standards and practices established and observed by the Industry. Mine emergency systems and their establishment are to meet Legislative and Industry standards.
5. **Underpinning Knowledge.** A knowledge of the listed topics/disciplines in sufficient scope and depth to enable the candidate to establish the mine emergency system.

A knowledge of:

- audit review process and techniques
- call-out procedures
- classification of types of incidents
- decision making processes
- deployment of staff underground
- economic considerations and decisions
- effects of heat and humidity
- effects of visibility
- emergency and disaster planning processes and techniques
- emotional effects of emergencies on rescuers and mine personnel
- environmental risks and controls
- equipment handling
- equipment required for different types of emergency
- escape strategies and technology
- hazard identification
- incident resources and how to access them
- industry and legislative stakeholders
- insurance policies and considerations
- intervention and control techniques for heating, fires, explosions, outburst, extrication or inrushes
- legal implications of incidents
- legal requirements of incident management teams
- legislation applicable to mines
- legislation regarding resumption of normal operations
- legislative requirements
- media policies and procedures
- mine closure procedures and the legislative implications
- mine rescue guidelines and capabilities
- mine-type incidents and risks
- numbers needed to run the mine at planned operational levels
- rescue team structure, procedures and equipment, and standby team requirements
- risk management principles and techniques
- sealing procedures and the legislative implications
- self-escape philosophies, systems and equipment
- services and agencies available to assist in an emergency
- structure of emergency guidelines
- structure of emergency organisations
- structure, roles, capabilities and operational limitations of external resources and agencies used during mines incidents
- support services role and access
- the requirements and structure for fresh air base/refuge chambers
- the role of stakeholders
• the techniques and equipment used for collecting and analysing atmospheric conditions
• titles and roles of members of incident management team
• training and assessment principles
• ventilation and its influence on incidents, and decisions to be made.

UNDERPINNING SKILLS

6. The ability to:

• read and interpret mine plans
• identify hazards and assess risk
• evaluate systems and equipment
• write reports
• identify or establish mine-site facilities for incident management
• access and use mine-site information and recording systems
• communicate effectively with people personally or through technical devices during incidents
• organise personnel and resources
• communicate effectively with members of the media
• develop action plans
• analyse information
• make effective decisions
• participate as a team member
• facilitate groups to work together
• brainstorm to collect maximum information
• effectively question
• effectively interview
• carry out fault-tree or equivalent analyses
• delegate responsibility and tasks.

KEY COMPETENCIES

<table>
<thead>
<tr>
<th>Key Competency</th>
<th>1</th>
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<tr>
<td>Collecting, analysing &amp; organising information</td>
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<td>Using technology</td>
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**MNIC11A Establish a blasting system**

**Description:** This unit covers the use of appropriate measures and criteria to establish the blasting system, including support arrangements.

Its application provides for the strategic management functions required to develop, establish and maintain a mine blasting system.

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<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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<tr>
<td>C11.1</td>
<td>Identify and Evaluate the Criteria to Create a Blasting System.</td>
</tr>
<tr>
<td></td>
<td>C11.1.1 The legislative, statutory and site requirements related to blasting are accessed, identified and interpreted.</td>
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<td></td>
<td>C11.1.2 Blasting methods and options are identified from an analysis of all relevant technical, environmental and operational and financial information.</td>
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<td>C11.1.3 The requirements for blasting materials are identified against mine requirements.</td>
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<td></td>
<td>C11.1.4 The requirements for and purpose of blasting equipment and supporting infrastructure are identified in accordance with mine design and system of mining.</td>
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<tr>
<td></td>
<td>C11.1.5 Potential sites/routes for blasting and supporting infrastructure are assessed by visit, located on mine plan and confirmed.</td>
</tr>
<tr>
<td>C11.2</td>
<td>Establish a System for Blasting.</td>
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<tr>
<td></td>
<td>C11.2.1 Procedures to identify hazards and analyse, evaluate and manage risks associated with blasting are established.</td>
</tr>
<tr>
<td></td>
<td>C11.2.2 Operational procedures for blasting, covering methods, materials, equipment and infrastructure are developed from site and legislative requirements and incorporated into site documentation.</td>
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<td></td>
<td>C11.2.3 Recording and reporting procedures for blasting information are established.</td>
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<td></td>
<td>C11.2.4 Safe blasting procedures, including design management, are developed for the site to comply with company and statutory/legal requirements.</td>
</tr>
<tr>
<td>C11.2.5</td>
<td>Monitoring procedures for blasting are established.</td>
</tr>
<tr>
<td>C11.2.6</td>
<td>Procedures for reviewing and modifying work processes are developed and established.</td>
</tr>
<tr>
<td>C11.2.7</td>
<td>Blasting system is developed as an integral component of the occupational health and safety management system of the mine.</td>
</tr>
<tr>
<td>C11.3</td>
<td>Establish the Support Arrangements for the Blasting System.</td>
</tr>
<tr>
<td>C11.3.1</td>
<td>Appropriate magazine/storage facilities are identified and established from an analysis of all relevant statutory, technical and management information.</td>
</tr>
<tr>
<td>C11.3.2</td>
<td>Appropriate transportation and handling methods for explosives are identified and established from an analysis of all relevant statutory, technical, operational and financial information.</td>
</tr>
<tr>
<td>C11.3.3</td>
<td>Maintenance procedures for blasting equipment and infrastructure systems are developed from statutory and site requirements and incorporated into site documentation.</td>
</tr>
<tr>
<td>C11.3.4</td>
<td>A program, including systems and procedures, to satisfy blasting and shotfiring training requirements, is established.</td>
</tr>
<tr>
<td>C11.4</td>
<td>Establish Systems for Audit and Review of the Blasting System.</td>
</tr>
<tr>
<td>C11.4.1</td>
<td>Procedures to evaluate and confirm the blasting system compliance with statutory and site requirements are established.</td>
</tr>
<tr>
<td>C11.4.2</td>
<td>Future blasting and supporting infrastructure system requirements are identified, assessed and incorporated into planning processes.</td>
</tr>
<tr>
<td>C11.4.3</td>
<td>Procedures to confirm the currency and compliance of blasting equipment and infrastructure maintenance and safety standards are established.</td>
</tr>
<tr>
<td>C11.4.4</td>
<td>Procedures for incorporating feedback into the audit/review process are established.</td>
</tr>
<tr>
<td>C11.4.5</td>
<td>Procedures to confirm the currency, relevance and compliance of the blasting training program against identified requirements are established.</td>
</tr>
</tbody>
</table>
C11.4.6 Procedures for response to instances of non-compliance or other discrepancies/deficiencies revealed by audit are established.

C11.4.7 Emergency response and evacuation plans and procedures are audited for compliance with legislative and site requirements.

**DEFINITION OF TERMS**

For the purposes of this standard, the definitions below apply:

- **audit**: a systematic examination against defined criteria to determine whether activities and related results conform to planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve the organisation's policy and objectives.

- **risk**: the combination of the frequency, or probability of occurrence, and consequence of a specified hazardous event.

- **hazard**: a source or a situation with a potential for harm in terms of human injury or ill-health, damage to property, damage to the environment, or a combination of these.

- **standard operating procedures (SOP)**: are also known as safe working procedures, safe operating procedures and standard working procedures.

**RANGE OF VARIABLES**

This competency standard is applicable for those with managerial responsibilities. This may be as a Senior/Specialist Manager or as an owner of a business. These competencies may be applicable in combination with other industries, occupations or workplace specific competencies.

It is to be exhibited in the work area of managerial responsibility which might be an entire enterprise or department of an enterprise.

The competency involves application of relevant legislation, codes of practice, guidelines and/or recognised standards, the maintenance of records, provision of information and dealing with committees, statutory/legal agencies, and organisational representatives.
Factors in the selection of blasting materials may include rock properties, hardness, degree of breakage required, physical items such as cables, persons and also environmental considerations.

Processes for consultation include committees, consultation with statutory/legal agencies/site representatives, issue resolution procedures and participative/consultative procedures conducted by supervisory staff within the area of managerial responsibility.

Monitoring of activities may include review of written reports, performance appraisal or auditing procedures.

Management is responsible for but is not limited to:
- blasting schedules in compliance and accordance with statutory/legal regulations that are in place
- site conditions that may vary and may require differing methods of safe initiation (weather, winds, storms etc.)
- geological factors influencing blast design, initiation systems and environmental compliance
- geographic location of site in relation to neighbours who may be affected by consequence of blast or blast design
- alternate explosives types and availability that may affect or influence blast design
- delay designs and ignition sources
- blasting licences, competencies and permits
- laser profiling
- bore hole tracking
- interpreting and communicating information
- pursuing optimum performance in blasting operations
- monitoring/videoing blasting practice for safety and other considerations
- monitoring processes for noise and vibration
- processes for minimising fly rock.

Consultation would typically include:
- community
- contractors
- employees
- customers
- regulatory authorities.

Resources may include, but are not limited to:
- people
- equipment
- storage magazines
- power/energy
- technology
- blasting materials/inventory
- information.

Statutory/legal compliance may include but is not limited to:
- Australian Standard 2187 (Explosives - Storage, Transport and Use)
• Australian Code for the Transport of Explosives by Road & Rail. (Australian Explosives Code)
• common law
• dangerous goods
• development of training policies/programmes to aid compliance
• environmental
• explosives
• industrial relations
• local government
• minerals and extractive industry licensing
• navigation
• planning and assessment
• safety and health
• trade practices
• waterways
• weights and measures
• workers compensation/workcover

Planning and development requirements may include:
• interpreting and communicating information
• business/performance plans
• location
• tender specifications
• communication liaison/public relations
• resources
• statutory/legal/organisational requirements and control
• resource parameters
• technical standards established by industry and/or enterprise
• legal issues/processes
• planning approvals
• surveying
• monitoring.

EVIDENCE GUIDE

1. Context of Assessment

The ultimate competency outcome is for the candidate to be able to establish a blasting and supporting infrastructure system and, in so doing, to satisfy the performance criteria and underpinning knowledge requirements agreed by the industry in this Competency Unit.

Mine blasting system circumstances and requirements will differ markedly between mine sites. Therefore, there are limitations on the extent to which the practical establishment of a blasting system may be assessed in the workplace. To bridge this potential gap and to ensure the candidate is able to apply the extensive theory to a working situation, assessment is likely to include some formal simulation exercises.

The assessment system for this competency is to cover the following:
A. Theory and knowledge underpinning the competency which is a mandatory requirement

B. Application of theory to a generic practical situation/simulation which is a mandatory requirement

OR

C. Practical establishment of mine blasting system or equivalent activity.

There are special considerations in respect of Assessment C. It is unlikely that all candidates will be able, in terms of access, reasonable economic constraints and reasonable time frames, to physically establish a blasting system.

In most cases it would be reasonable to infer competency if a candidate has completed assessments A and B in respect of each required competency and has satisfied assessment C in respect of this competency or has completed the conduct of a formal audit/review of an existing and significant blasting system.

2. Inter-dependent Assessment of Units

Whilst there are some common features between the units at this level, commonality is generally limited to science and engineering theory and the planning process. This unit requires the specialised application of knowledge. Generalised assessment is unlikely to satisfy the requirements of this unit or of the other allied units.

Unless inter-dependent assessment can be clearly demonstrated to satisfy the specialised requirements of each subject unit, and do so in a transparent and timely manner, the assessment should be on a unit by unit basis.

This unit covers four primary functions or outcomes being the identification and evaluation of the criteria to create a blasting system, establishing procedures and systems for blasting, establishing support arrangements for the system and establishing systems for audit and review. It therefore represents an activity which may result in a range of other management and technical competencies being invoked.

3. Critical Aspects of Evidence. The Industry has established that, for portability purposes, it is essential that competence in this unit reflects successful assessment in the critical aspects of:

- applying personal and operational safety and health procedures
- interpreting and communicating information on blasting systems and supporting arrangements
- identifying hazards and managing risks related to blasting operations
- identifying and evaluating the criteria to create a blasting system
- establishing a system for blasting
- establishing the blasting system support and infrastructure arrangements
- defining roles and responsibilities for management of the blasting system
- documenting the blasting system
- integrating the blasting system into the occupational health and safety management system
- establishing and reviewing statutory reporting procedures
• monitoring and evaluating blast performance
• establishing and reviewing the training program
• establishing and reviewing the blasting related emergency response and disaster plans and procedures
• reviewing and auditing the effectiveness of the blasting system.

4. **Consistency of Performance.** Consistency of performance in this unit is aided by the standards of performance, which are contained within State Legislation and by professional standards and practices established and observed by the Industry. Blasting systems and their establishment are to meet Legislative and Industry standards.

**UNDERPINNING KNOWLEDGE**

5. **Underpinning Knowledge.** A knowledge of the listed topics/disciplines in sufficient scope and depth to enable the candidate to develop (or cause to be developed) and establish the blasting systems and supporting arrangements.

A knowledge of:

• blast design criteria
• blast monitoring techniques
• blast timings
• blasting operations
• characteristics and applications of blasting products
• charging techniques
• computer applications
• customer/client relations
• delays and their application
• document control systems
• drilling plant and equipment
• environmental management
• explosives disposal procedures
• explosives inventory control requirements
• explosives procurement procedures
• explosives storage and magazine requirements
• explosives transport and handling requirements
• mine products and services
• misfire management techniques
• negotiation techniques
• quality systems
• risk management: principles, strategies and applications
• safety and health requirements
• statutory requirements and controls
• surveying
• team management techniques.

**UNDERPINNING SKILL**
6. **The ability to:**
- access and use mine-site information and recording systems
- analyse and review blasting operations
- analyse information
- brainstorm to collect maximum information
- carry out fault-tree or equivalent type of risk analysis
- co-ordinate resources - human, financial and physical
- delegate responsibility and tasks
- develop action plans
- evaluate systems and equipment
- facilitate groups to work together
- identify hazards and assess risk
- identify or establish mine-site facilities for blasting management
- make effective decisions
- manage magazines and contents
- manage projects and tasks
- organise personnel and resources
- participate as team member
- read and interpret mine plans
- write reports.

### KEY COMPETENCIES

<table>
<thead>
<tr>
<th>Key Competency</th>
<th>Level</th>
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<tbody>
<tr>
<td>Collecting, analysing &amp; organising information</td>
<td>1</td>
</tr>
<tr>
<td>Communicating ideas &amp; information</td>
<td></td>
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<tr>
<td>Planning &amp; organising activities</td>
<td></td>
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<tr>
<td>Working with others in teams</td>
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<tr>
<td>Using mathematical ideas &amp; techniques</td>
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<tr>
<td>Solving problems</td>
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<td>Using technology</td>
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<td>2</td>
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</table>
**MNIC12A Establish mine closure management systems**

**Description:**
This unit covers the use of appropriate measures and criteria to establish mine closure management systems.

Its application provides for the strategic management functions required to evaluate, design and implement the mine closure.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>C12.1 Identify and Evaluate the Criteria to Establish Mine Closure Management Systems.</td>
<td>C12.1.1 The legislative, statutory, legal and site requirements related to the mine closure are accessed, identified and interpreted.</td>
</tr>
<tr>
<td>C12.1.2 Mine survey data is identified, collected, accessed and interpreted in accordance with statutory and site requirements.</td>
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</tr>
<tr>
<td>C12.1.3 The mine environmental management system is accessed and information related to mine closure is identified and interpreted.</td>
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</tr>
<tr>
<td>C12.1.4 Historical information relating to the mine site is identified, evaluated and recorded.</td>
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<tr>
<td>C12.1.5 All possible mining structure failure modes relevant to the mine site are identified, assessed and interpreted.</td>
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<tr>
<td>C12.1.6 The necessary resources required for mine closure are identified and recorded.</td>
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</tr>
<tr>
<td>C12.2 Identify and Evaluate Hazards and Risks for Mine Closure.</td>
<td>C12.2.1 Existing and potential hazards are correctly identified and identification confirmed in accordance with environmental legislation, codes of practice and trends identified from the environmental management system.</td>
</tr>
<tr>
<td>C12.2.2 The risks associated with mine closure are analysed.</td>
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<tr>
<td>C12.2.3 The limitations and controls applying to mine closure are identified and assessed.</td>
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</tr>
<tr>
<td>C12.3 Identify and Evaluate Geological and</td>
<td>C12.3.1 Geological structures are identified and evaluated.</td>
</tr>
<tr>
<td>Geotechnical Information for Mine Closure.</td>
<td>C12.3.2 Hydrogeological features are identified and evaluated.</td>
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</tr>
<tr>
<td></td>
<td>C12.3.3 Strata characteristics are identified and evaluated.</td>
</tr>
<tr>
<td></td>
<td>C12.3.4 Rock types and ore body features and physical properties are identified and evaluated.</td>
</tr>
<tr>
<td></td>
<td>C12.3.5 Stress regimes are identified and evaluated.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C12.4 Identify and Evaluate Mining Engineering Principles and Practices.</th>
<th>C12.4.1 Mining system types and methods are identified and evaluated.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C12.4.2 Stable mining structures and slope stability is identified from engineering analysis.</td>
</tr>
<tr>
<td></td>
<td>C12.4.3 Mining constraints impacting on the stable mining structure and slope stability are identified and evaluated.</td>
</tr>
<tr>
<td></td>
<td>C12.4.4 Equipment requirements, appropriate for the mine closure are identified and evaluated.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C12.5 Establish the Mine Closure System.</th>
<th>C12.5.1 The legislative, statutory, legal and site requirements on mine closure are designed and established.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C12.5.2 The mine environmental management system for mine closure is designed and established.</td>
</tr>
<tr>
<td></td>
<td>C12.5.3 The hazards and risk management systems for mine closure are designed and established.</td>
</tr>
<tr>
<td></td>
<td>C12.5.4 Closure system documentation is designed and completed.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C12.6 Audit and Review the Effectiveness of the Mine Closure System.</th>
<th>C12.6.1 The legislative, statutory, legal and site requirements on mine closure are audited for compliance.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C12.6.2 The mine environmental management system for mine closure is audited for legal and site compliance.</td>
</tr>
<tr>
<td></td>
<td>C12.6.3 The hazards and risk management systems for mine closure are audited for compliance with site requirements.</td>
</tr>
</tbody>
</table>
C12.6.4 Monitoring systems are audited for compliance with statutory and site standards.

C12.6.5 Recording systems are audited for compliance with site requirements.

C12.6.6 Future mine closure requirements and standards are identified, assessed and incorporated into future planning procedures.

C12.6.7 Procedures for response to instances of non-compliance or other discrepancies/deficiencies revealed by audit are established.

**DEFINITION OF TERMS**

For the purposes of this standard, the definitions below apply:

**audit**
a systematic examination against defined criteria to determine whether activities and related results conform to planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve the organisation's policy and objectives.

**mine design**
is the process of engineering analysis applied to the systems and sequences involved in mining.

**risk**
the combination of the frequency, or probability of occurrence, and consequence of a specified hazardous event.

**hazard**
a source or a situation with a potential for harm in terms of human injury or ill-health, damage to property, damage to the environment, or a combination of these.

**standard operating procedures (SOP)**
are also known as safe working procedures, safe operating procedures and standard working procedures.

**Range of variables**

This competency standard is applicable for those with managerial responsibilities. This may be as a Senior/Specialist Manager or as an owner of a business. These competencies may be applicable in combination with other industries, occupations or workplace specific competencies.

It is to be exhibited in the work area of managerial responsibility which might be an entire enterprise or department of an enterprise.

The competency involves application of relevant legislation and codes of practice, and the maintenance of records, provision of information and dealing with committees, statutory/legal agencies, organisational representatives.
Processes for consultation may include committees, consultation with statutory/legal agencies/site representatives, issue resolution procedures and participative/consultative procedures conducted by supervisory staff within the area of managerial responsibility.

Monitoring of activities may include review of written reports, performance appraisal or auditing procedures.

**Mining systems and methods may include, but are not limited to:**
- bord and pillar
- cut and fill
- sub-level mining
- open stoping
- panel stoping
- bench stoping
- shrinkage.

**Stress includes, but is not limited to:**
- horizontal and vertical tectonic induced stress
- mining induced stress.

**Geological and hydrogeological information includes that related to, but not limited to:**
- caving characteristics
- direction and competency of faults or inliers
- fill characteristics
- hanging wall and foot wall technical data
- induced collapse
- intrusions and deformities
- over and underlying rock type
- permeability of rocks and faults
- physical properties
- subsidence
- sulphide content of ore
- underground fissures and water sources.

**Mine site historical information may include, but is not limited to:**
- caving characteristics
- existence of previous workings within the orebody
- fill characteristics
- hanging wall and foot wall technical data
- hydrology
- mass blasts
- over and underlying and adjacent rock formations
- permeability of rocks and faults
- physical property testing results of rock types
- pillar strengths and dimensions
- Radon gas content
- sedimentology aspects of the minesite relating to subsidence
- sulphide dust explosions
- underground fissures and water sources.
Mine design may include in whole or in part:
- drives and cross-cuts
- fault drivage
- fault management
- footwall and longwall subsidence
- geology
- hanging wall and footwall competency requirements
- haulages, inclines and declines
- legislative and statutory requirements
- mining induced stress
- modelling
- ore grades
- over and underlying rock type
- partial extraction
- pillar extraction
- return airways
- rises and winzes
- roof and floor technical data
- sequencing
- shaft sinking
- shafts and adits
- stone drivage
- ventilation.

Mine gases include gases from introduced sources and may include:
- carbon dioxide
- carbon monoxide
- oxides of nitrogen
- hydrogen
- sulphur dioxide
- hydrogen sulphide
- aldehydes
- hydrocarbons
- combinations including particulates.

Structure controls include, but are not limited to:
- competency of fill
- competency of ground support
- direction of mining
- influences of stresses and depth
- pillar sizes
- production sequencing
- size of mine opening
- stress regimes and base characteristics
- systems of mining
- underground opening characteristics
- water ingression.
Management must comply with statutory/legal requirements. These may include:

- environmental - noise/air/water
- environmental
- safety and health requirements
- rehabilitation
- quantities
- zonings
- boundaries
- processes
- royalties
- explosives
- dangerous goods
- mineral resources or appropriate body
- federal/state/local government
- harbours and marine
- port authority.

Title searches including:

- land ownership
- council
- lease
- by-laws
- contamination
- wildlife corridors

Planning and development such as:

- interpreting and communicating information
- business/performance plans
- location
- tender specifications
- communication liaison/public relations
- resources
- statutory/legal/organisational requirements and control
- resource parameters
- surveying
- technical standards established by industry and/or enterprise
- legal issues/processes
- planning approvals.

Management interaction/negotiation may be with but is not limited to:

- community
- contractors
- customers
- employees
operating managers
project managers
regulatory authorities
safety and health committees/representatives
stakeholders
federal/state/local government
suppliers
tenderers
trainers and training organisations.

Resources may include, but are not limited to:
people
buildings/facilities
finance
equipment
power/energy
technology.

EVIDENCE GUIDE

1. Context of Assessment

The ultimate competency outcome is for the candidate to be able to establish mine closure systems and, in so doing, to satisfy the performance criteria and underpinning knowledge requirements agreed by the industry in this Competency Unit.

Mine closure system circumstances and requirements will differ markedly between mine sites. Therefore, there are limitations on the extent to which the practical establishment of mine closure systems may be assessed in the workplace. To bridge this potential gap and to ensure the candidate is able to apply the extensive theory to a working situation, assessment is likely to include formal simulation exercises.

The assessment system for this competency is to cover the following:

A. Theory and knowledge underpinning the competency which is a mandatory requirement

B. Application of theory to a generic practical situation/simulation which is a mandatory requirement

OR

C. Practical establishment of mine closure systems or equivalent activity.

There are special considerations in respect of Assessment C. It is unlikely that all candidates will be able, in terms of access, reasonable economic constraints and reasonable time frames, to physically establish all the mine systems.

In most cases it would be reasonable to infer competency if a candidate has completed assessments A and B in respect of each required competency and has satisfied assessment C
in respect of this competency or the conduct of a formal audit/review of an existing mine closure management system.

Naturally, if this competency unit is being undertaken as a stand-alone unit rather than as one within a qualification cluster, Assessment C is to be treated as a mandatory requirement.

2. Inter-dependent Assessment of Units

Whilst there are some common features between the units at this level, commonality is generally limited to science and engineering theory and the planning process. This unit requires the specialised application of knowledge. Generalised assessment is unlikely to satisfy the requirements of this unit or of the other allied units.

Unless inter-dependant assessment can be clearly demonstrated to satisfy the specialised requirements of each subject unit, and do so in a transparent and timely manner, the assessment should be on a unit by unit basis.

This unit covers six primary functions or outcomes being the identification and evaluation of criteria to establish mine closure management systems, the identification and evaluation of hazards and risks, the identification and evaluation of geological and geotechnical information, mining engineering principles and practices and control options, establishing the management plan and auditing and reviewing the effectiveness of the management plan. It therefore represents an activity which may result in a range of other management and technical competencies being invoked.

3. Critical Aspects of Evidence. The Industry has established that, for portability purposes, it is essential that competence in this unit reflects successful assessment in the critical aspects of:
   • applying personal and operational safety and health procedures
   • interpreting and communicating information on the management of mine closure
   • identifying and evaluating mining engineering principles and practices
   • identifying and evaluating the closure management system performance criteria
   • identifying and evaluating geological, geotechnical and hydrogeological features
   • identifying and evaluating ground support systems
   • identifying hazards and managing risks related to mine closure
   • developing and recording the mine closure management system
   • evaluating and defining equipment requirements
   • establishing statutory and site monitoring, reporting and recording system
   • auditing and reviewing mining closure systems.

4. Consistency of Performance. Consistency of performance in this unit is aided by the standards of performance, which are contained within State Legislation and by professional standards and practices established and observed by the Industry. Mine slope stability and stable mining systems and their establishment are to meet Legislative and Industry standards.

UNDERPINNING KNOWLEDGE
5. **Underpinning Knowledge.** A knowledge of the listed topics/disciplines in sufficient scope and depth to enable the candidate to establish criteria and systems for mine closure.

**A knowledge of:**

- access, evaluate and apply data from organisational systems
- action planning methods
- advanced negotiation skills
- advanced written and oral communication methods
- community safety control responsibilities
- environmental management
- geophysical control systems
- human resource management
- mine operating procedures
- organisational goals and objectives
- receptive listening skills
- rehabilitation requirements and techniques
- reporting and recording procedures
- risk control and management systems
- safety and health rules, policies, procedures and regulations
- statutory and site rules, policies, procedures and regulations
- statutory/legal controls
- work procedure/instruction writing.

**UNDERPINNING SKILLS**

6. **The ability to:**

- read, interpret, apply and communicate technical information, rules, procedures, regulations etc.
- read, interpret and apply legislation
- access, interpret and apply technical information
- access, interpret and apply mine survey information
- access and analyse archival and historical information related to the mine
- develop and maintain risk management procedures and policies
- produce own ideas from experience and practice
- produce a variety of solutions before taking a decision
- provide leadership and guidance for group activities

**UNDERPINNING SKILLS**

- communicate effectively in the workplace
- facilitate and document risk control planning
- maintain relevant records and documents
- monitor and decide on changes to process
- explain complex information to superiors/subordinates
• provide coaching and mentoring support
• adopt communications styles appropriate to listeners and situations, including selecting an appropriate time and place
• take a leading role in initiating action and making decisions
• listen actively, ask questions, clarify points and rephrase others' statements to check mutual understanding
• show sensitivity to the needs and feelings of others.

**KEY COMPETENCIES**

<table>
<thead>
<tr>
<th>Key Competency</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
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<td>Collecting, analysing &amp; organising information</td>
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<td>Solving problems</td>
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<tr>
<td>Using technology</td>
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</table>
**MNIS01A Establish ground control and slope stability systems**

**Description:**
This unit covers the use of appropriate measures and criteria to establish ground control and slope stability systems.

This unit covers the application of the principles of mine design to the establishment and ongoing development of ground control and slope stability systems.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1.1 Identify and Evaluate the Criteria to Create and Maintain Ground Control and Slope Stability.</td>
<td>S1.1.1 The legislative, statutory and site requirements related to ground control and slope stability are accessed, identified and interpreted.</td>
</tr>
<tr>
<td></td>
<td>S1.1.2 Mine survey data is identified, collected, accessed and interpreted in accordance with statutory and site requirements.</td>
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<tr>
<td></td>
<td>S1.1.3 The necessary resources required to create and maintain ground control and slope stability are identified and recorded.</td>
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<td>S1.2 Identify and Evaluate Geological and Geotechnical Information to Establish Ground Control and Slope Stability.</td>
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<td>S1.2.3 Hydrogeological features are identified and evaluated.</td>
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</tbody>
</table>
S1.2.4 Hanging wall, foot wall, orebody characteristics and physical properties are identified and evaluated.

S1.2.5 Stress regimes are identified and evaluated.

S1.3 Identify and Evaluate Mining Engineering Principles and Practices.

S1.3.1 Mining system types and methods are identified and evaluated.

S1.3.2 Potential layouts for ground control and slope stability are identified from engineering analysis.

S1.3.3 Mining constraints impacting on the development of ground control and slope stability are identified and evaluated.

S1.3.4 Equipment requirements, appropriate for the development and maintenance of ground control and slope stability are identified and evaluated.

S1.4 Identify and Evaluate Control Options.

S1.4.1 Ground support systems are identified and evaluated.

S1.4.2 Ground support installation, monitoring and assessment systems are identified and evaluated.

S1.4.3 Causes and impacts of failure mechanisms are identified and evaluated.

S1.4.4 Natural and induced stress control methods are identified and evaluated.

S1.5 Establish the Ground Control and Slope Stability System.

S1.5.1 Exploration programs identifying geological features and characteristics impacting on mining operations are designed and established.

S1.5.2 Methods of access are designed and established.

S1.5.3 Systems of mining are designed and established.

S1.5.4 Sequences for mining operations are designed and established.

S1.5.5 System specifications and documentation are designed and established.

S1.5.6 A program, including systems and procedures to satisfy identified training requirements, is
established.

S1.5.7 Emergency response and evacuation plans and procedures are established in accordance with site requirements.

S1.5.8 Safe operating procedures are established and incorporated into site documentation.

S1.6 Audit and Review the Effectiveness of the Ground Control and Slope Stability System.

S1.6.1 Control and slope stability standards are audited for compliance with statutory and site requirements.

S1.6.2 Mine survey data is audited for compliance with statutory and site requirements.

S1.6.3 Monitoring systems are audited for compliance with statutory and site standards.

S1.6.4 Recording systems are audited for compliance with statutory and site requirements.

S1.6.5 System maintenance program and procedures are audited for compliance with statutory and site requirements.

S1.6.6 Emergency plans are audited for compliance with statutory and site requirements.

S1.6.7 The ground control and slope stability training program is audited for currency, relevance and compliance with the site requirements.

S1.6.8 Emergency response and evacuation plans and procedures are audited for compliance with site requirements.

S1.6.9 Future site mining requirements and standards are identified, assessed and incorporated into the planning procedures as stipulated by the ground control and slope stability system.

S1.6.10 Procedures for response to instances of non-compliance or other discrepancies/deficiencies revealed by audit are established.

DEFINITION OF TERMS

For the purposes of this standard, the definitions below apply:

Audit a systematic examination against defined criteria to determine
whether activities and related results conform to planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve the organisation's policy and objectives.

**Mine design** is the process of engineering analysis applied to the systems and sequences involved in mining.

**Risk** is the combination of the frequency, or probability of occurrence, and consequence of a specified hazardous event.

**Hazard** is a source or a situation with a potential for harm in terms of human injury or ill-health, damage to property, damage to the environment, or a combination of these.

**standard operating procedures (SOP)** are also known as safe working procedures, safe operating procedures and standard working procedures.

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**RANGE OF VARIABLES**

This competency standard is applicable for those with managerial responsibilities. This may be as a Senior/Specialist Manager or as an owner of a business. These competencies may be applicable in combination with other industries, occupations or workplace specific competencies.

To be exhibited in the work area of managerial responsibility which might be an entire enterprise or department of an enterprise.

Involves application of relevant legislation and codes of practice, and the maintenance of records, provision of information and dealing with committees, statutory/legal agencies, organisational representatives.

Processes for consultation include committees, consultation with statutory/legal agencies/site representatives, issue resolution procedures and participative/consultative procedures conducted by supervisory staff within the area of managerial responsibility.

Monitoring of activities may include review of written reports, performance appraisal or auditing procedures.

**Resources may include but are not limited to:**
- skilled personnel
- bolts, cable and grout
- face drilling equipment
- power systems
- mine services
- special application equipment
- budgetary requirements.

**Stress includes, but is not limited to:**
- horizontal and vertical tectonic induced stress
- mining induced stress
- primary and secondary stress fields.

**Geological and hydrogeological information includes that related to, but not limited to:**
- direction and competency of faults or inliers
- induced collapse
- intrusions and deformities
- over and underlying rock types
- permeability of rocks and faults
- physical properties
- subsidence
- fissures and water sources.

**Mine site historical information may include, but is not limited to:**
- existence of previous workings within the mine
- hydrology
- over and underlying rock types
- permeability of rocks and faults
- physical property testing results of rock types
- seismic activity
- sedimentology aspects of the minesite relating to subsidence
- fissures and water sources
- water pumped from mine.

**Mine design may include in whole or in part requirements relating to:**
- access
- drives
- fault monitoring
- geology
- hanging wall and foot wall technical data
- legislative and statutory requirements
- mine drainage
- mine plant
- mining induced stress
- modelling
- multiple ore bodies
- ore grades
- over and underlying rock types
- sequencing
- spontaneous combustion
- subsidence.

**Stable structure controls include, but are not limited to:**
- blast management
- competency of ground support
- faults and fissures
- final pit design
- geotechnical modelling
• ground support methods (various)
• influences of stresses and depth
• pre-split blasting
• rock characteristics
• sequence of mining
• strength of rock types
• stress regimes and base characteristics
• system of mining
• water management.

**Management must comply with statutory/legal requirements. These may include:**

• environmental - noise/air/water
• boundaries
• royalties
• explosives
• dangerous goods
• emergency services
• rehabilitation
• mineral resources or appropriate body
• safety and health requirements
• environmental
• federal/state/local government
• harbours and marine
• port authority.

**Management interaction/negotiation may be with but is not limited to:**

• stakeholders
• regulatory authorities
• tenderers
• operating managers
• project managers
• contractors
• employees
• community
• suppliers
• customers
• state/federal/local government
• safety and health committees/representatives.

**EVIDENCE GUIDE**

1. **Context of Assessment**

The ultimate competency outcome is for the candidate to be able to establish ground control and slope stability systems and, in so doing, to satisfy the performance criteria and underpinning knowledge requirements agreed by the industry in this Competency Unit.

Mine ground control and slope stability characteristics will differ markedly between mine sites. Therefore, there are limitations on the extent to which the practical establishment of
mine ground control and slope stability systems may be assessed in the workplace. To bridge this potential gap and to ensure the candidate is able to apply the extensive theory to a working situation, assessment is likely to include formal simulation exercises.

The assessment system for this competency is to cover the following:

A. Theory and knowledge underpinning the competency which is a mandatory requirement

B. Application of theory to a generic practical situation/simulation which is a mandatory requirement

OR

C. Practical establishment of mine ground control and slope stability systems or equivalent activity.

There are special considerations in respect of Assessment C. It is unlikely that all candidates will be able, in terms of access, reasonable economic constraints and reasonable time frames, to physically establish all the mine's operational systems.

In most cases it would be reasonable to infer competency if a candidate has completed assessments A and B in respect of each required competency and has satisfied assessment C in respect of one of the required systems. This inference is based on the fact that a candidate, who has competently established one system, would be capable of establishing other systems if they have satisfied the theory and generic applications, which form part of the required competencies.

Naturally, if this competency unit is being undertaken as a stand-alone unit rather than as one within a qualification cluster, Assessment C is to be treated as a mandatory requirement.

2. Inter-dependent Assessment of Units

Whilst there are some common features between the units at this level, commonality is generally limited to science and engineering theory and the planning process. This unit requires the specialised application of knowledge. Generalised assessment is unlikely to satisfy the requirements of this unit or of the other allied units.

Unless inter-dependent assessment can be clearly demonstrated to satisfy the specialised requirements of each subject unit, and do so in a transparent and timely manner, the assessment should be on a unit by unit basis.

This unit covers a range of functions or outcomes being the identification and evaluation of system criteria, geological and geotechnical information, mining engineering principles and practices, control and stability options, the establishment of the system and the auditing of its effectiveness. It therefore represents an activity which may result in a range of other management and technical competencies being invoked.

3. Critical Aspects of Evidence. The Industry has established that, for portability purposes, it is essential that competence in this unit reflects successful assessment in the critical aspects of:

- applying personal and operational safety and health procedures
• interpreting and communicating information on ground control and slope stability systems
• evaluating mine site and failure mode historical information relating to the creation of ground control and slope stability
• identifying and recording resource requirements
• identifying hazards and managing risks related to ground control and slope stability
• identifying and evaluating exploration techniques
• identifying and evaluating geological and hydrogeological features
• evaluating rock characteristics, lithological features and stress regimes
• developing potential layouts
• evaluating mining constraints and defining equipment requirements
• establishing the ground control and slope stability systems
• establishing statutory and site monitoring, reporting and recording system
• establishing ground control and slope stability training component
• auditing and reviewing the ground control and slope stability system.

4. **Consistency of Performance.** Consistency of performance in this unit is aided by the standards of performance, which are contained within State Legislation and by professional standards and practices established and observed by the Industry. The establishment of ground control and slope stability systems is to meet Legislative and Industry standards.

**UNDERPINNING KNOWLEDGE**

5. **Underpinning Knowledge.** A knowledge of the listed topics/disciplines in sufficient scope and depth to enable the candidate to develop (or cause to be developed) and establish criteria and systems for ground control and stable mining conditions.

A knowledge of:

• audit methodologies
• exploration techniques
• factors of safety
• ground support methods and systems
• legislative and statutory requirements for mining structures including mine plans, ground support and safety management systems
• mine planning and design
• mine surveying
• mining and general engineering principles
• mining structure failure modes
• rock types and characteristics
• slope stability criteria
• stress analysis including mining induced stress, vertical and horizontal stress tectonics
• systems of work
• the systems of mining including ore body development.

**UNDERPINNING SKILL**
6. The ability to:

- access, interpret and apply technical information
- access, interpret and apply mine survey information
- access and analyse archival and historical failure information related to the mine
- interpret and apply mathematical and scientific theorems/laws related to ground control and slope stability
- perform mathematical calculations
- interpret and apply design criteria for ground control and slope stability systems
- interpret computer spreadsheets and mining systems modelling/simulations
- collect, collate and interpret mining data
- prepare technical procedures relating to ground control and slope stability systems
- conduct enquiries/investigations and prepare reports
- communicate effectively in the workplace
- access data from monitoring systems and equipment
- analyse and report on ground control and slope stability system training needs
- apply risk management processes and techniques.

### KEY COMPETENCIES

<table>
<thead>
<tr>
<th>Key Competency</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
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<tbody>
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**MNIS02A Establish surface product haulage and transport systems**

Description: This unit covers the use of appropriate measures and criteria to establish surface product haulage and transport systems.

Its application provides for the strategic management functions required to develop and establish safe surface product haulage and transport systems.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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</table>
| **S2.1** Develop Product Haulage and Transport Systems. | S2.1.1 The legislative, statutory and site requirements related to product haulage and transport systems are accessed, interpreted and clarified.  
S2.1.2 The requirements for and purpose of product haulage and transport systems are identified in accordance with the system of mining.  
S2.1.3 Systems options are identified from an analysis of all relevant technical, operational and financial information.  
S2.1.4 A specification for the product haulage and transport system is developed from a comprehensive analysis of mine needs.  
S2.1.5 The preferred systems options are selected on the basis of performance against criteria. |
| **S2.2** Select Equipment for Product Haulage and Transport Systems. (Continued). | S2.2.1 The requirements for and purpose of product haulage and transport equipment are identified against systems requirements.  
S2.2.2 A detailed scoping of the work requirement is conducted and key selection criteria, including hazard identification and risk analysis, is developed.  
S2.2.3 A specification for the required product haulage and/or transport equipment is developed.  
S2.2.4 The preferred equipment solutions are selected on the basis of performance against criteria. |
| **S2.3** Establish Installation and Commissioning Procedures. | S2.3.1 Procedures to identify hazards and analyse and evaluate risks associated with the installation of product haulage and transport systems and equipment are established.  
S2.3.2 Procedures for integrating new and existing mine
| S2.3.3 | Safe operating procedures and rules are developed from a detailed analysis of legislative and work site requirements. |
| S2.3.4 | Product haulage and transport systems and equipment installation and commissioning procedures are developed and established. |
| S2.3.5 | A program, including systems and procedures, to satisfy identified product haulage and transport systems training requirements is established. |
| S2.3.6 | Emergency response and evacuation plans and procedures are established in accordance with site requirements. |
| S2.4.1 | Operational procedures for product haulage and transport systems and equipment are developed and incorporated into site documentation. |
| S2.4.2 | Maintenance procedures for product haulage and transport systems and equipment are developed from site and legislative requirements and incorporated into site documentation. |
| S2.4.3 | Procedures for reviewing and modifying work processes are developed and established. |
| S2.5.1 | Procedures to evaluate and confirm system/equipment compliance with statutory and site requirements are established. |
| S2.5.2 | Future product haulage and transport systems and equipment requirements are identified, assessed and incorporated into planning processes. |
| S2.5.3 | Procedures to confirm the currency of and compliance with product haulage and transport maintenance and safety standards are established. |
| S2.5.4 | The system of recording and reporting product haulage and transport equipment information is established. |
| S2.5.5 | Procedures for incorporating feedback into the audit/review system are established. |
S2.5.6 Procedures to confirm the currency, relevance and compliance with the training program against identified requirements are established.

S2.5.7 Procedures for response to instances of non-compliance or other discrepancies / deficiencies revealed by audit are established.

S2.5.8 Emergency response and evacuation plans and procedures are audited for compliance with site requirements.

**DEFINITION OF TERMS**

For the purposes of this standard, the definitions below apply:

**audit**

A systematic examination against defined criteria to determine whether activities and related results conform to planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve the organisation's policy and objectives.

**risk**

The combination of the frequency, or probability of occurrence, and consequence of a specified hazardous event.

**hazard**

A source or a situation with a potential for harm in terms of human injury or ill-health, damage to property, damage to the environment, or a combination of these.

**RANGE OF VARIABLES**

Transport systems include capacities for personnel, equipment/materials and product and may be:

- wheeled
- railed
- skidded
- water borne
- pipeline
- conveyor system.

Wheeled transport may include but not be limited to:

- rubber tyred man transport
- multi purpose vehicles
- forklifts
- front end loader
- skid steer loader.
**Rail transport may include:**
- locomotives (electric/diesel)
- rolling stock.

Water borne transport may include barges and lighters.

**Conveyor system may include:**
- conveyor belts
- drive heads
- tail ends transfer points
- surge bins
- fabricated bins.

**Pipeline pumping may include:**
- batching stations
- dewatering systems
- water reticulation pumping stations.

**Safety information and standards may be contained in:**
- legislation and regulations
- relevant International/Australian standards
- management plans
- health and safety policy
- codes of practice
- industry guidelines
- approved standards
- manufacturers' instructions
- standard operational procedures
- job instructions (or equivalent).

**Maintenance may be divided into:**
- predictive
- preventive
- breakdown.

**Site documentation and training policy may include but not be limited to:**
- statutory and legislative requirements
- management plans and procedures.

**Specifications may include, but not be limited to:**
- performance requirements
- costs
- dimensions
- capacity
- safety and health requirements
- training requirements
- key selection criteria.

Management must comply with statutory/legal requirements. These may include:
- environmental - noise/air/water
- boundaries
- royalties
- rehabilitation
- mineral resources or appropriate body
- safety and health authority
- environmental
- harbours and marine
- port authority.

**Planning and development may include:**
- interpreting and communicating information
- business/performance plans
- location
- tender specifications
- resources
- statutory/legal/organisational requirements and control
- resource parameters
- best practice
- technical standards established by industry and/or enterprise
- planning approvals
- surveying
- infrastructure/technology requirements and would typically incorporate the following specifications:
  * products
  * production rate
  * recyclable materials
  * hours per week of operation
  * waste and stockpiles
  * water management
  * transportation systems
  * safety and health/environmental
- all weather dust and noise levels/controls access/haul roads.

**Management interaction/negotiation may be with but is not limited to:**
- stakeholders
- regulatory authorities
- tenderers
- operating managers
- project managers
- contractors
- employees
- community
- suppliers
- customers
- State/Federal/Local Government.
Resources may include, but are not limited to:
- people
- buildings/facilities
- finance
- equipment
- power/energy
- technology
- information
- time.

EVIDENCE GUIDE

1. Context of Assessment

The ultimate competency outcome is for the candidate to be able to establish surface mine product haulage and transport systems and, in so doing, to satisfy the performance criteria and underpinning knowledge requirements agreed by the industry in this Competency Unit.

Underground mine product haulage and transport requirements will differ markedly between mine sites. Therefore, there are limitations on the extent to which the practical establishment of mine product haulage and transport systems may be assessed in the workplace. To bridge this potential gap and to ensure the candidate is able to apply the extensive theory to a working situation, assessment is likely to include formal simulation exercises.

The assessment system for this competency is to cover the following:

A. Theory and knowledge underpinning the competency which is a mandatory requirement

B. Application of theory to a generic practical situation/simulation which is a mandatory requirement

OR

C. Practical establishment of a surface mine product haulage and transport system or equivalent activity.

There are special considerations in respect of Assessment C. It is unlikely that all candidates will be able, in terms of access, reasonable economic constraints and reasonable time frames, to physically establish all the mine's operational systems.

In most cases it would be reasonable to infer competency if a candidate has completed assessments A and B in respect of each required competency and has satisfied assessment C in respect of one of the required systems. This inference is based on the fact that a candidate, who has competently established one system, would be capable of establishing other systems if they have satisfied the theory and generic applications which form part of the required competencies.

Naturally, if this competency unit is being undertaken as a stand alone unit rather than as one within a qualification cluster, Assessment C is to be treated as a mandatory requirement.
2. **Inter-dependent Assessment of Units**

Whilst there are some common features between the units at this level, commonality is generally limited to science and engineering theory and the planning process. This unit requires the specialised application of knowledge. Generalised assessment is unlikely to satisfy the requirements of this unit or of the other allied units.

Unless inter-dependent assessment can be clearly demonstrated to satisfy the specialised requirements of each subject unit, and do so in a transparent and timely manner, the assessment should be on a unit by unit basis.

3. **Critical Aspects of Evidence.** The Industry has established that, for portability purposes, it is essential that competence in this unit reflects successful assessment in the critical aspects of:

- applying personal and operational safety and health procedures
- interpreting and communicating information on product haulage and transport systems
- identifying hazards and managing risks related to product haulage and transport systems
- applying mine design principles to minimise the likelihood of inappropriate product haulage and/or transport systems and equipment being sourced and commissioned
- evaluating and selecting product haulage and transport systems and equipment
- defining roles and responsibilities for management of product haulage and transport systems
- documenting product haulage and transport systems
- establishing statutory reporting procedures
- establishing and reviewing the related training program
- reviewing and auditing the effectiveness of the product haulage and transport system
- establishing and reviewing product haulage and transport system related emergency response procedures.

4. **Consistency of Performance.** Consistency of performance in this unit is aided by the standards of performance which are contained within State Legislation and by professional standards and practices established and observed by the Coal Industry. Mine product haulage and transport systems and their establishment are to meet Legislative and Industry standards.

**UNDERPINNING KNOWLEDGE**

5. **Underpinning Knowledge.** A knowledge of the listed topics/disciplines in sufficient scope and depth to enable the candidate to develop (or cause to be developed) and establish surface product haulage and transport systems.

A knowledge of:

- audit review processes and techniques
- computer based systems
• emergency response and evacuation planning processes and techniques
• fire fighting systems and precaution rules
• geological structures
• legislative and statutory requirements and instructions including transport rules, maintenance schemes, standard operating procedures, training, battery charging, positioning of fuel depots, conveyor belts
• maintenance surveys
• mine design relating to product haulage and transport systems and equipment
• mine operation procedures
• mine plans
• mine reporting procedures
• power sources including electrical, hydraulic, pneumatic, diesel
• product haulage and transport systems and equipment statutory inspection requirements
• product haulage and transport systems equipment management requirements
• product haulage and transport equipment and systems; the types, uses, characteristics and limitations appropriate for safe operation at the mine site
• risk management procedures
• safety design features of product haulage and transport systems
• site environmental monitoring requirements.
• specification design criteria including noise, dust, lighting, ergonomics, remote control, physical clearance, confined space, visibility, seating vibration and machine equipment and personal protection
• stores system
• training and assessment systems.

**UNDERPINNING SKILLS**

6. The ability to:

• access, interpret and apply:
  - technical information
  - briefings and handover details
• assess the risks and consequences attached to product haulage and transport systems and equipment
• develop procedures appropriate to mine operations for management of product haulage and transport systems and equipment
• plan and coordinate work
• identify training needs related to product haulage and transport systems
• interpret and apply manufacturers' instructions
• conduct maintenance surveys.

**KEY COMPETENCIES**

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<tr>
<td>Activity</td>
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**MNIU01A Establish ground control and stable mining systems**

Description: This unit covers the use of appropriate measures and criteria to establish ground control and stable mining systems.

This unit covers the application of the principles of mine design to the establishment and ongoing development of stable mining systems.

<table>
<thead>
<tr>
<th>ELEMENT</th>
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<tbody>
<tr>
<td>U1.1 Identify and Evaluate the Criteria to Create and Maintain a Stable Mining Structure.</td>
<td>U1.1.1 The legislative, statutory and site requirements related to stable mining systems are accessed, identified and interpreted.</td>
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<tr>
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<td>U1.1.2 Mine survey data is identified, collected, accessed and interpreted in accordance with statutory and site requirements.</td>
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<td>U1.1.3 The necessary resources required to create and maintain a stable mining structure are identified and recorded.</td>
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<td>U1.1.4 Historical information relating to the mine site is identified, evaluated and recorded.</td>
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<td>U1.1.5 All possible mining structure failure modes relevant to the mine site are identified, assessed and recorded.</td>
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<td>U1.1.6 The criteria for establishing the quantitative stability of mining structures are established.</td>
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<td>U1.1.7 The risks associated with unstable mining structures are analysed.</td>
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<td>U1.1.8 The limitations and controls applying to design of stable mining structures are identified and assessed.</td>
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<td>U1.2 Identify and Evaluate Geological and Geotechnical Information to Establish a Stable Mining Structure.</td>
<td>U1.2.1 Exploration techniques are identified and evaluated.</td>
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<td>U1.2.2 Geological structures are identified and evaluated.</td>
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U1.2.4 Hanging wall, foot wall, orebody characteristics and physical properties are identified and evaluated.

U1.2.5 Stress regimes are identified and evaluated.

U1.3 Identify and Evaluate Mining Engineering Principles and Practices.

U1.3.1 Mining system types and methods are identified and evaluated.

U1.3.2 Potential layouts for stable mining structures are identified from engineering analysis.

U1.3.3 Mining constraints impacting on the development of a stable mining structure are identified and evaluated.

U1.3.4 Equipment requirements, appropriate for the development and maintenance of a stable mining structure are identified and evaluated.

U1.4 Identify and Evaluate Control Options.

U1.4.1 Ground support systems are identified and evaluated.

U1.4.2 Ground support installation, monitoring and assessment systems are identified and evaluated.

U1.4.3 Causes and impacts of failure mechanisms are identified and evaluated.

U1.4.4 Natural and induced stress control methods are identified and evaluated.

U1.5 Establish the Ground Control and Stable Mining System.

U1.5.1 Exploration programs identifying geological features and characteristics impacting on mining operations are designed and established.

U1.5.2 Methods of entry are designed and established.

U1.5.3 Systems of mining are designed and established.

U1.5.4 Sequences for mining operations are designed and established.

U1.5.5 System specifications and documentation are designed and established.

U1.5.6 A program, including systems and procedures to satisfy identified training requirements, is
U1.5.7 Emergency response and evacuation plans and procedures are established in accordance with site requirements.

U1.5.8 Safe operating procedures are established and incorporated into site documentation.

U1.6 Audit and Review the Effectiveness of the Ground Control and Stable Mining System.

U1.6.1 Stable structure standards are audited for compliance with statutory and site requirements.

U1.6.2 Mine survey data is audited for compliance with statutory and site requirements.

U1.6.3 Monitoring systems are audited for compliance with statutory and site standards.

U1.6.4 Recording systems are audited for compliance with statutory and site requirements.

U1.6.5 System maintenance program and procedures are audited for compliance with statutory and site requirements.

U1.6.6 Emergency plans are audited for compliance with statutory and site requirements.

U1.6.7 The stable mining structure training program is audited for currency, relevance and compliance with the site requirements.

U1.6.8 Emergency response and evacuation plans and procedures are audited for compliance with site requirements.

U1.6.9 Future site mining requirements and standards are identified, assessed and incorporated into the planning procedures as stipulated by the ground control and stable mining structure system.

U1.6.10 Procedures for response to instances of non-compliance or other discrepancies/deficiencies revealed by audit are established.

**DEFINITION OF TERMS**

For the purposes of this standard, the definitions below apply:

**audit**

a systematic examination against defined criteria to determine
whether activities and related results conform to planned
arrangements and whether these arrangements are implemented
effectively and are suitable to achieve the organisation's policy
and objectives.

**mine design**
is the process of engineering analysis applied to the systems and
sequences involved in mining.

**risk**
the combination of the frequency, or probability of occurrence,
and consequence of a specified hazardous event.

**hazard**
a source or a situation with a potential for harm in terms of
human injury or ill-health, damage to property, damage to the
environment, or a combination of these.

**Standard operating procedures (SOP)**
are also known as safe working procedures, safe operating
procedures and standard working procedures.
This competency standard is applicable for those with managerial responsibilities. This may be as a Senior/Specialist Manager or as an owner of a business. These competencies may be applicable in combination with other industries, occupations or workplace specific competencies.

To be exhibited in the work area of managerial responsibility which might be an entire enterprise or department of an enterprise.

Involves application of relevant legislation and codes of practice, and the maintenance of records, provision of information and dealing with committees, statutory/legal agencies, organisational representatives.

Processes for consultation include committees, consultation with statutory/legal agencies/site representatives, issue resolution procedures and participative/consultative procedures conducted by supervisory staff within the area of managerial responsibility.

Monitoring of activities may include review of written reports, performance appraisal or auditing procedures.

**Resources may include but are not limited to:**
- skilled personnel
- bolts, cable and grout
- face drilling equipment
- power systems
- mine services
- special application equipment
- budgetary requirements.

**Mining systems and methods may include, but are not limited to:**
- cut and fill
- mechanised cut and fill
- shrinkage stoping
- sub-level stoping
- open stoping
- bench stoping
- panel stoping
- pillar extraction
- caving methods
- post pillar
- slots mining.

**Stress includes, but is not limited to:**
- horizontal and vertical tectonic induced stress
- mining induced stress
- primary and secondary stress fields.
Geological and hydrogeological information includes that related to, but not limited to:

- caving characteristics
- direction and competency of faults or inliers
- hanging wall and foot wall
- induced collapse
- intrusions and deformities
- over and underlying rock types
- permeability of rocks and faults
- physical properties
- subsidence
- sulphide content of ore
- underground fissures and water sources
- windblast.

Mine site historical information may include, but is not limited to:

- caving characteristics
- existence of previous workings within the mine
- hanging wall and footwall data
- hydrology
- mass blasts
- over and underlying rock types
- permeability of rocks and faults
- physical property testing results of rock types
- rockburst and seismic activity
- sedimentology aspects of the minesite relating to subsidence
- sulphide dust explosions
- underground fissures and water sources
- water pumped from mine.

Mine design may include in whole or in part requirements relating to:

- cross-cuts
- declines/inclines
- drives
- fault monitoring
- geology
- hanging wall and foot wall technical data
- legislative and statutory requirements
- mine drainage
- mine plant
- mining induced stress
- modelling
- multiple ore bodies
- ore grades
- outburst
- over and underlying rock types
- partial extraction
- pillar extraction
RANGE OF VARIABLES …Continued…

- sequencing
- shaft pillar
- shaft sinking and shaft location
- spontaneous combustion
- stone drivage
- subsidence
- sulphide content of ore
- ventilation
- windblast.

Stable structure controls include, but are not limited to:

- mine opening dimensions
- pillar sizes
- influences of stresses and depth
- strength of rock types
- stress regimes and base characteristics
- rock characteristics
- competency of fill
- system of mining
- sequence of mining
- competency of ground support
- direction of mining
- stress shadow area
- faults and fissures.

Management must comply with statutory/legal requirements. These may include:

- environmental - noise/air/water
- boundaries
- royalties
- explosives
- dangerous goods
- emergency services
- rehabilitation
- mineral resources or appropriate body
- safety and health requirements
- environmental
- federal/state/local government
- harbours and marine
- port authority.

Management interaction/negotiation may be with but is not limited to:

- stakeholders
- regulatory authorities
- tenderers
- operating managers
• project managers
• contractors
• employees
• community
• suppliers
• customers
• state/federal/local government
• safety and health committees/representatives.

EVIDENCE GUIDE

1. Context of Assessment

The ultimate competency outcome is for the candidate to be able to establish ground control and stable mining infrastructure systems and, in so doing, to satisfy the performance criteria and underpinning knowledge requirements agreed by the industry in this Competency Unit.

Mine ground control systems and stability characteristics will differ markedly between mine sites. Therefore, there are limitations on the extent to which the practical establishment of mine ground control systems may be assessed in the workplace. To bridge this potential gap and to ensure the candidate is able to apply the extensive theory to a working situation, assessment is likely to include formal simulation exercises.

The assessment system for this competency is to cover the following:

A. Theory and knowledge underpinning the competency which is a mandatory requirement

B. Application of theory to a generic practical situation/simulation which is a mandatory requirement

OR

C. Practical establishment of mine ground control and stable mining systems or equivalent activity.

There are special considerations in respect of Assessment C. It is unlikely that all candidates will be able, in terms of access, reasonable economic constraints and reasonable time frames, to physically establish all the mine's operational systems.

In most cases it would be reasonable to infer competency if a candidate has completed assessments A and B in respect of each required competency and has satisfied assessment C in respect of one of the required systems. This inference is based on the fact that a candidate, who has competently established one system, would be capable of establishing other systems if they have satisfied the theory and generic applications, which form part of the required competencies.

Naturally, if this competency unit is being undertaken as a stand-alone unit rather than as one within a qualification cluster, Assessment C is to be treated as a mandatory requirement.

2. Inter-dependent Assessment of Units
Whilst there are some common features between the units at this level, commonality is generally limited to science and engineering theory and the planning process. This unit requires the specialised application of knowledge. Generalised assessment is unlikely to satisfy the requirements of this unit or of the other allied units.

Unless inter-dependent assessment can be clearly demonstrated to satisfy the specialised requirements of each subject unit, and do so in a transparent and timely manner, the assessment should be on a unit by unit basis.

This unit covers a range of functions or outcomes being the identification and evaluation of system criteria, geological and geotechnical information, mining engineering principles and practices, control options, the establishment of the system and the auditing of its effectiveness. It therefore represents an activity which may result in a range of other management and technical competencies being invoked.

4. **Critical Aspects of Evidence.** The Industry has established that, for portability purposes, it is essential that competence in this unit reflects successful assessment in the critical aspects of:

- applying personal and operational safety and health procedures
- interpreting and communicating information on ground control and stable mining systems
- evaluating mine site and failure mode historical information relating to the creation of stable mining structures
- identifying and recording resource requirements
- identifying hazards and managing risks related to ground control and stable mining systems
- identifying and evaluating exploration techniques
- identifying and evaluating geological and hydrogeological features
- evaluating rock characteristics, lithological features and stress regimes
- developing potential layouts
- evaluating mining constraints and defining equipment requirements
- establishing ground control systems
- establishing statutory and site monitoring, reporting and recording system
- establishing ground control training component
- auditing and reviewing the ground control and stable mining system.

5. **Consistency of Performance.** Consistency of performance in this unit is aided by the standards of performance, which are contained within State Legislation and by professional standards and practices established and observed by the Industry. The establishment of ground control and stable mining systems is to meet Legislative and Industry standards.

5. **Underpinning Knowledge.** A knowledge of the listed topics/disciplines in sufficient scope and depth to enable the candidate to develop (or cause to be developed) and establish criteria and systems for ground control and stable mining conditions.

A knowledge of:
- legislative and statutory requirements for mining structures including mine plans, ground support and safety management systems
- mine planning and design
- the systems of mining including drives, cross-cuts, rises, winzes, declines, inclines, shafts and ore body development.
- stress analysis including mining induced stress, vertical and horizontal stress tectonics
- rock types and characteristics including subsidence, faults and fissures, permeability of rock types, hydrology, physical property testing, caving characteristics, windblast and hanging wall and foot wall conditions
- systems of work including mining and extraction such as pillar recovery and the use of various types of fill material
- mining structure failure modes
- exploration techniques.
- mining and general engineering principles relevant to the behaviour of excavations in rock.
- ground support methods and systems
- audit methodologies
- pillar design criteria:
  - pillar stress/strain/strength/ratios
  - width/height ratios
- roof support design criteria
- Mohr's Circle
- Young's Modulus
- Poisson's Ratio
- stress distribution diagrams
- factors of safety
- mine surveying.

**UNDERPINNING SKILL**

6. The ability to:

- access, interpret and apply technical information
- access, interpret and apply mine survey information
- access and analyse archival and historical failure information related to the mine
- interpret and apply mathematical and scientific theorems/laws related to stable mining systems
- perform mathematical calculations
- interpret and apply design criteria for stable mining systems
- interpret computer spreadsheets and stable mining systems modelling/simulations
- collect, collate and interpret mining data
- prepare technical procedures relating to mining systems
- conduct enquiries/investigations and prepare reports
- communicate effectively in the workplace
- access data from monitoring systems and equipment
- analyse and report on stable mining systems training needs
- apply risk management processes and techniques.
<table>
<thead>
<tr>
<th>Key Competency</th>
<th>Level 1</th>
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<tr>
<td>Collecting, analysing &amp; organising information</td>
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<td>Communicating ideas &amp; information</td>
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<td>Planning &amp; organising activities</td>
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<td>Working with others in teams</td>
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<tr>
<td>Using mathematical ideas &amp; techniques</td>
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<td>Solving problems</td>
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<tr>
<td>Using technology</td>
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MNIU02A Establish the ventilation management system

Description: This unit covers the use of appropriate measures and criteria to develop and establish an underground mine ventilation management system.

Its application provides for the strategic management functions required to plan, develop, establish and maintain an underground mine ventilation management system.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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<tr>
<td>U2.1 Identify, Analyse and Evaluate Hazards Associated with Mine Atmosphere.</td>
<td>U2.1.1 The sources and hazards of gases and fumes are identified and evaluated.</td>
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<td></td>
<td>U2.1.2 The hazards of airborne and flammable dust are identified and evaluated.</td>
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<tr>
<td></td>
<td>U2.1.3 The likely impact of gas drainage is identified, analysed and evaluated.</td>
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<td></td>
<td>U2.1.4 The hazards of fire and explosion are identified, analysed and evaluated.</td>
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<td>U2.1.5 The potential for and impact of major pressure differentials are identified, analysed and evaluated.</td>
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<td>U2.1.6 The effect of changes in air temperature and moisture content are identified, analysed and evaluated.</td>
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<td>U2.1.7 The potential for and likely impact of spontaneous combustion on mine ventilation is identified, analysed and evaluated.</td>
</tr>
<tr>
<td>U2.2 Identify, Analyse and Evaluate Events Which Impact on Ventilation.</td>
<td>U2.2.1 The impact of disruption to the ventilation system is identified and evaluated.</td>
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<tr>
<td></td>
<td>U2.2.2 The causes and effects of recirculation are identified and evaluated.</td>
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<td>U2.2.3 The potential for and likely impact of windblast is identified, analysed and evaluated.</td>
</tr>
<tr>
<td></td>
<td>U2.2.4 The impacts of bolting into previous workings are identified, analysed and evaluated.</td>
</tr>
<tr>
<td>U2.3 Identify, Analyse and Evaluate Mine Ventilation Control Options and Measures.</td>
<td>U2.3.1 Ventilation planning and evaluation of major airways and shafts is conducted to maintain the long-term mine production schedule.</td>
</tr>
<tr>
<td>U2.4 Design and Develop the Ventilation Management System.</td>
<td>U2.4.1 The legislative, statutory and site requirements related to ventilation management including those related to diesel exhaust and temperature condition, are accessed, interpreted and clarified.</td>
</tr>
</tbody>
</table>
of the ventilation system.

U2.4.7 Ventilation and environmental monitoring systems are incorporated into the design and development of the ventilation system.

U2.5 Establish the Ventilation Management System.

U2.5.1 Mine ventilation objectives, systems descriptions and responsibilities are established and incorporated into the ventilation management system.

U2.5.2 Resources for the approved ventilation system are procured.

U2.5.3 Procedures for the installation, functioning and maintenance of ventilation monitoring systems are established in the ventilation management system.

U2.5.4 Procedures for the installation, operation and changes to ventilation devices are prepared and established in the ventilation management system.

U2.5.5 A system of early warning for each identified hazard is developed, including action requirements for each event, and incorporated into the ventilation management system.

U2.5.6 Ventilation system maintenance program and procedures are formulated and incorporated into the ventilation management system.

U2.5.7 Audit, review and updating procedures for the ventilation systems are incorporated into the ventilation management system.

U2.5.8 Ventilation emergency and evacuation systems and procedures are developed and established in the ventilation management system.

U2.5.9 A program, including systems and procedures, to satisfy identified ventilation management training requirements is established.

U2.5.10 Procedures for developing, controlling, implementing, recording and communicating changes to mine ventilation systems and components are established and incorporated into the ventilation management system.
Audit and Review the Ventilation Management System.

Ventilation standards are audited for compliance with statutory and ventilation management system specifications.

Ventilation control devices are audited for compliance with statutory and ventilation management system requirements.

Monitoring systems are audited for compliance with statutory and ventilation management system standards.

Ventilation recording systems are audited for compliance with the ventilation management system.

Ventilation system maintenance program and procedures are audited for compliance with the ventilation management system.

The ventilation management training program is audited for currency, relevance and compliance with the requirements of the ventilation management system.

Ventilation, emergency and evacuation systems are trialed and audited for compliance with the ventilation management system.

Future ventilation requirements are identified, evaluated and incorporated into the mine ventilation system.

Procedures for response to instances of non-compliance or other discrepancies/deficiencies revealed by audit are established.

**DEFINITION OF TERMS**

For the purposes of this standard, the definitions below apply:

**ventilation system** is one which covers all the mine workings, including all surface and underground fans, shafts, airways and ventilation devices which control or impact on mine ventilation.

**mine ventilation control device** means a door, regulator, seal, stopping, air crossings, pressure chambers or other control device to control or direct ventilation flows in a mine.

**risk** the combination of the frequency, or probability of occurrence, and consequence of a specified hazardous event.
**hazard** is a source of potential harm or a situation with a potential to cause loss.

**ventilation management system development process** includes:
- hazard identification and quantification
- planning and mine design
- emergency and evacuation procedures
- risk assessment
- authority and responsibility
- controls established to manage identified risks
- reporting and communication
- document control
- audit and review

**principles of mine design** include reserve optimisation, mining direction, geological structures, ventilation, strata control, mining method, productivity, environmental and orebody considerations.

**action (alarm or trigger)** is a generic term used to describe an event determined at the mine site at which action is initiated or a response made.

**audit** is the process by which the validation of procedures, processes and systems are assured.

**standard operating procedures (SOP)** are also known as safe working procedures, safe operating procedures and standard working procedures.

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### RANGE OF VARIABLES

This competency standard is applicable for those with managerial responsibilities. This may be as a Senior/Specialist Manager or as an owner of a business. These competencies may be applicable in combination with other industries, occupations or workplace specific competencies.

To be exhibited in the work area of managerial responsibility which might be an entire enterprise or department of an enterprise.

Involves application of relevant legislation and codes of practice, and the maintenance of records, provision of information and dealing with committees, statutory/legal agencies, organisational representatives.

Processes for consultation include committees, consultation with statutory/legal agencies/site representatives, issue resolution procedures and participative/consultative procedures conducted by supervisory staff within the area of managerial responsibility.

**Mine atmosphere refers to all areas in the mine.**

**Geological conditions may include:**
- faults, fissures
- dykes
- intrusions and rock deformities
- induced stress or strain.

**Gases may include but are not limited to:**
- carbon dioxide
• carbon monoxide
• hydrocarbons and combinations
• hydrogen
• hydrogen sulphide
• methane
• oxides of nitrogen
• sulphur dioxide.

Other atmospheric contaminants may include:
• respirable dust
• irrespirable dust
• welding fumes
• radon daughters
• organic vapours
• nuisance dust
• asbestiform minerals
• diesel fumes and particulates
• blasting fumes and particulates
• products of fire.

Types of fires may include:
• chemical
• fuels and oils
• timbers and packaging
• plastics
• rubber.

Ignition sources may include:
• electrical
• static discharge
• friction
• hot surfaces
• spontaneous combustion
• naked flame (welding and cutting)
• chemical
• tyres
• conveyor belts
• blasting.

Hazards from fires and explosions may include:
• noxious and flammable gases
• heat
• contaminants
• altered ventilation pressures/flows
• direct physical impacts and weakening of the rock properties
• complete disruption to the ventilation system
• loss of visibility
• lack of oxygen
• smoke.

**Disruptions/ventilation pressure changes may result from and include:**

• those resulting from planned disruptions
• primary fan off
• fall of ground
• fan changes/failure
• ventilation control device changes/failure
• outburst
• holing into previous workings
• re-circulation
• ventilation circuit change
• natural ventilation pressure change
• explosion
• changes in ambient temperature/humidity
• fire
• equipment movements (e.g. in shaft)
• flooding
• electrical failure
• combinations of above.

**Factors which may impact on temperature/humidity may include:**

• climatic conditions
• ventilation quantities
• location of workplaces
• mine layout and design
• casual water
• depth (auto-compression)
• ventilation control device failure
• recirculation
• presence of diesel engine
• geothermal gradient
• uncovered drains and sumps
• high thermal conductivity of rock.

**Recirculation causes may include or be related to:**

• location of underground auxiliary/booster fans
• blocked return airway
• leaking ducting
• failure or poor design of mining and ventilation systems
• gas densities
• layering
• wind blast
• mine fires
• fall of ground
• fan failure
• incorrect setting of ventilation control device
• incorrect auxiliary fan selection
• inadequate primary ventilation.

**Effect of recirculation may include:**
• build up of contaminant concentration (gas, fumes, heat) and a decrease in oxygen
• diesel engines emitting more atmospheric contaminants
• build up of dust or radiation concentrations
• build up of humidity/moisture content.

**Criteria for safe mine ventilation may include:**
• statutory and regulatory requirements
• measures to reduce and/or control atmospheric contaminants
• control of moisture content and temperature
• control of diesel and blasting fumes and particulates
• control of ventilation efficiency
• maintaining the desired quality and quantity of mine air at all work places and travel ways
• size of openings
• rate of mining
• use of diesel equipment
• mining systems/methods

• provision of primary circuits
• provision of secondary circuits
• control of adverse conditions (dust, recirculation)
• location and adjustment of ventilation control devices
• provision of return airways (dedicated)
• dust control at tripping and crushing locations.

**Factors which impact on the selection of ventilation control systems may include:**
• accessibility
• design
• explosion rating
• ground conditions
• location
• mining method
• pressure differential
• statutory requirements
• the life of the installation
• volume of air.

**Methods of ventilation may include:**
• push/pull
• exhaust
• auxiliary
• parallel
• series
• combination of above.

**Analytical and interpretative tools may include:**
• fan laws
- airway resistance
- network analysis
- computer simulation
- gas laws
- psychrometry
- ventilation laws
- Atkinsons equation
- First law of thermodynamics.

Fan types are axial flow, venturi and centrifugal.

**Fan design considerations include:**
- types
- mine layout
- user requirements and fan laws
- characteristics (pressure and volume)
- duty control (speed-variable pitch)
- configuration (parallel-series)
- explosion/fire doors
- auxiliary drive
- restart procedures
- maintenance requirements.

**Ventilation control devices may include:**
- doors
- regulators
- seals
- stoppages
- air crossings
- bulk heads
- pressure chambers
- air locks
- fans
- drop-board regulators.

**Ventilation management training applies to:**
- mine workers
- tradespeople
- permanent employees
- contractors
- mine officials
- other special requirements.

**Monitoring devices may include:**
- barograph
- gas monitoring device (CO)
- real time telemetry
• portable (hand held) monitoring
• fan pitch
• pito and pitostatic tubes
• kilowatt hour meter
• ampmeter
• wet and dry bulb temperature graphs.

**Water may impact on the mine ventilation management plan through:**
• liberation of dissolved gases (e.g. radon)
• capture of soluble gases and fumes
• drainage efficiency
• energy for evaporation
• dust liberation and suppression
• large ingresses disrupting ventilation networks
• ventilation requirements for pumping stations
• humidity/moisture content
• hydrostatic pressure
• absorption of oxygen
• cooling
• air density.

**Alarm systems and action plans may include:**
• condition monitoring for fans (vibration/temperature/current/failures)
• ventilation devices and monitoring hardware
• gas monitoring indicator
• store condition at fan
• power failure.

**Surveys may include:**
• pressure/quantity/temperature survey
• gas/dust survey
• oxygen
• air velocity.

**Standards and procedures required to support the ventilation management plan may include:**
• those for construction
• action response
• permit to work
• condition monitoring
• auditing
• maintenance
• document control
• atmosphere monitoring
• ventilation system control
• communication systems
• survey procedures
• sealing procedures
- changes
- training
- systems recording/reporting.

**Defects to ventilation control devices may include:**
- inferior design
- deterioration of materials
- inadequate quality of construction/installation
- physical damage
- water damage.

**Maintenance of the ventilation system may include:**
- inspection
- servicing
- repair
- records and inventory updating
- fan motors
- fan blades
- fan rotors
- monitoring devices.

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**EVIDENCE GUIDE**

1. **Context of Assessment**

The ultimate competency outcome is for the candidate to be able to establish an underground mine ventilation management system and, in so doing, to satisfy the performance criteria and underpinning knowledge requirements agreed by the industry in this Competency Unit.

Underground mine ventilation management system circumstances and requirements will differ markedly between mine sites. Therefore, there are limitations on the extent to which the practical establishment of mine ventilation management system may be assessed in the workplace. To bridge this potential gap and to ensure the candidate is able to apply the extensive theory to a working situation, assessment is to include formal simulation exercises.

The assessment system for this competency is to cover the following:

A. Theory and knowledge underpinning the competency which is a mandatory requirement

B. Application of theory to a generic practical situation/simulation which is a mandatory requirement

    OR

C. Practical establishment of mine ventilation management system or equivalent activity.
There are special considerations in respect of Assessment C. It is unlikely that all candidates will be able, in terms of access, reasonable economic constraints and reasonable time frames, to physically establish all these systems.

In most cases it would be reasonable to infer competency if a candidate has completed assessments A and B in respect of each required competency and has satisfied assessment C in respect of one of the required systems. This inference is based on the fact that a candidate, who has competently established one system, would be capable of establishing other systems if they have satisfied the theory and generic applications, which form part of the required competencies.

Naturally, if this competency unit is being undertaken as a stand-alone unit rather than as one within a qualification cluster, Assessment C is to be treated as a mandatory requirement.

2. Inter-dependant Assessment of Units

Whilst there are some common features between the units at this level, commonality is generally limited to science and engineering theory and the planning process. This unit requires the specialised application of knowledge. Generalised assessment is unlikely to satisfy the requirements of this unit or of the other allied units.

Unless inter-dependant assessment can be clearly demonstrated to satisfy the specialised requirements of each subject unit, and do so in a transparent and timely manner, the assessment should be on a unit by unit basis.

This unit covers six primary functions or outcomes being the identification, analysis and evaluation of hazards associated with mine atmosphere, the identification, analysis and evaluation of events which impact on ventilation, the identification, analysis and evaluation of mine ventilation control options and measures, the design and development of the ventilation management system, the establishment of the ventilation management system and the audit and review of the ventilation management plan. It therefore represents an activity which may result in a range of other management and technical competencies being invoked.

3. Critical Aspects of Evidence. The Industry has established that, for portability purposes, it is essential that competence in this unit reflects successful assessment in the critical aspects of:

- applying personal and operational safety procedures
- interpreting and communicating information on ventilation
- forecasting, calculating and planning for future ventilation requirements
- analysing ventilation risks and hazards and selecting achievable ventilation responses
- establishing the contents of a mine ventilation management system
- establishing, documenting and communicating ventilation system procedures
- establishing mine ventilation monitoring, recording and reporting systems
- establishing the ventilation system maintenance program
- evaluating and controlling changes to mine ventilation systems
- auditing and reviewing ventilation systems
- establishing the training component of the ventilation management system.
4. **Consistency of Performance.** Consistency of performance in this unit is aided by the standards of performance, which are contained within state legislation and by professional standards and practices established and observed by the Industry. Underground mine ventilation management system and its establishment is to meet legislative and Industry standards.

5. **A knowledge of the listed topics/disciplines in sufficient scope and depth to enable the candidate to design, develop (or cause to be designed and developed) and establish the underground ventilation management system.**

**A knowledge of:**

- legislative and statutory requirements for ventilation including air quality, maximum values, control and distribution, gas and dust limits, ventilation fans, atmospheric contaminant monitoring, respirable dust limits and inspections and recording/reporting
- the methods of mine ventilation and their applications/limitations including push/pull, exhaust, auxiliary, parallel, series and other combinations
- the methods of production and development ventilation and their applications/limitations including correct selection and location of auxiliary fans, machine mounted scrubber systems and compressed air venturis
- the impact of mining techniques and mine design on ventilation
- the impact of rock characteristics and ore body shape on mine ventilation design
- the principles and impacts on the ventilation system of mine drainage, sulphide dust and windblast
- mine gases; the types and their characteristics under varying circumstances, sources, physiological effects and methods of detection
- dust, gas and particulate matter; the types, sources, physical and physiological effect, and control/mitigation methods
- mine fires; the types, sources of ignition, possible effects on the ventilation circuit and prevention/control/mitigation methods
- mine blasting, possible effects on the ventilation circuits and prevention/control/mitigation methods
- pressure differentials; causes, the impacts on the ventilation system, and responses (to include the causes and effects of natural ventilation and recirculation)
- heat/moisture content of air; the sources and factors which may impact on mine ventilation and personnel
- mine roads and shafts; their design parameters and impact on mine ventilation
- mine fans; fan laws, fan types, performance characteristics, configurations, applications and limitations
- ventilation control devices; the types, purposes, design criteria and specifications, distribution/placement criteria and limitations
- ventilation networks and individual circuit design criteria, specifications and design processes
- fixed ventilation monitoring systems types, characteristics, uses and limitations
- portable monitoring equipment, types, characteristics, uses and limitations
- functions, capabilities, advantages, limitations and uses of computer modeling and simulation techniques
- computer-based systems for mine environment analysis
- ventilation management plan development requirements and processes
• ventilation surveys; the types, frequency and method for conducting including pressure/quantity/temperature and atmospheric contaminants
• processes and techniques for determining alarms and trigger points/levels
• audit and review processes and techniques
• emergency response and disaster planning processes and techniques
• general uses and applications of ventilation theory, including:
  – Atkinson's equation
  – methods of determining frictional resistance
  – frictional resistance values for mine airways and ducts
  – psychrometry and heat
  – gas laws including Charles and Boyle
  – natural ventilation pressures
  – static/velocity/total pressures and shock loss
  – control device leakage
  – duct leakage
  – determination of mine resistance curves
  – combining system resistance and fan curves
  – regulator and equivalent orifice calculation
  – determination of fan operating/duty points
  – Kirchoff's laws.

UNDERPINNING SKILLS

6. The ability to:

• access, interpret and apply technical information
• access and analyse archival and historical ventilation information related to the mine
• interpret and apply mathematical and scientific theorems/laws related to ventilation
• perform ventilation planning mathematical calculations
• access, evaluate and apply design criteria for ventilation systems and devices
• interpret computer spreadsheets and ventilation modelling/simulations
• collect, collate and evaluate ventilation data
• establish technical procedures relating to ventilation
• conduct enquiries/investigations and prepare reports
• communicate effectively in the workplace
• access, evaluate and apply data from monitoring systems and equipment
• operate hand held monitoring equipment
• establish ventilation training requirement, programs, systems and procedures
• apply risk management processes and techniques.

KEY COMPETENCIES

Key Competency Level
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MNIU03A Establish underground product haulage and transport systems

Description: This unit covers the use of appropriate measures and criteria to establish underground product haulage and transport systems. Its application provides for the strategic management functions required to develop and establish safe underground product haulage and transport systems.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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<tbody>
<tr>
<td>U3.1 Develop Product Haulage and Transport Systems.</td>
<td>U3.1.1 The legislative, statutory and site requirements related to product haulage and transport systems are accessed, interpreted and clarified.</td>
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<td>U3.1.2 The requirements for and purpose of product haulage and transport systems are identified in accordance with the system of mining.</td>
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<td>U3.1.3 Systems options are identified from an analysis of all relevant technical, operational and financial information.</td>
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<td>U3.1.4 A specification for the product haulage and transport system is developed from a comprehensive analysis of mine needs.</td>
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<td>U3.1.5 The preferred systems options are selected on the basis of performance against criteria.</td>
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<tr>
<td>U3.2 Select Equipment for Product Haulage and Transport Systems.</td>
<td>U3.2.1 The requirements for and purpose of product haulage and transport equipment are identified against systems requirements.</td>
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<td>U3.2.2 A detailed scoping of the work requirement is conducted and key selection criteria, including hazard identification and risk analysis, is developed.</td>
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<td>U3.2.3 A specification for the required product haulage and/or transport equipment is developed.</td>
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<td>U3.2.4 The preferred equipment solutions are selected on the basis of performance against criteria.</td>
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<tr>
<td>U3.3 Establish Installation and Commissioning Procedures.</td>
<td>U3.3.1 Procedures to identify hazards and analyse and evaluate risks associated with the installation of product haulage and transport systems and</td>
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</table>
U3.3.2 Procedures for integrating new and existing mine product haulage and transport systems and processes are developed and established.

U3.3.3 Safe operating procedures and rules are developed from a detailed analysis of legislative and work site requirements.

U3.3.4 Product haulage and transport systems and equipment installation and commissioning procedures are developed and established.

U3.3.5 A program, including systems and procedures, to satisfy identified product haulage and transport systems training requirements is established.

U3.3.6 Emergency response and evacuation plans and procedures are established in accordance with site requirements.

U3.4 Establish Systems for the Operation and Maintenance of Product Haulage and Transport Systems and Equipment.

U3.4.1 Operational procedures for product haulage and transport systems and equipment are developed and incorporated into site documentation.

U3.4.2 Maintenance procedures for product haulage and transport systems and equipment are developed from site and legislative requirements and incorporated into site documentation.

U3.4.3 Procedures for reviewing and modifying work processes are developed and established.


U3.5.1 Procedures to evaluate and confirm system/equipment compliance with statutory and site requirements are established.

U3.5.2 Future product haulage and transport systems and equipment requirements are identified, assessed and incorporated into planning processes.

U3.5.3 Procedures to confirm the currency of and compliance with product haulage and transport maintenance and safety standards are established.
U3.5.4 The system of recording and reporting product haulage and transport equipment information is established.

U3.5.5 Procedures for incorporating feedback into the audit/review system are established.

U3.5.6 Procedures to confirm the currency, relevance and compliance with the training program against identified requirements are established.

U3.5.7 Procedures for response to instances of non-compliance or other discrepancies / deficiencies revealed by audit are established.

U3.5.8 Emergency response and evacuation plans and procedures are audited for compliance with site requirements.

**DEFINITION OF TERMS**

For the purposes of this standard, the definitions below apply:

| **Audit** | a systematic examination against defined criteria to determine whether activities and related results conform to planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve the organisation's policy and objectives. |
| **Risk** | the combination of the frequency, or probability of occurrence, and consequence of a specified hazardous event. |
| **Hazard** | a source or a situation with a potential for harm in terms of human injury or ill-health, damage to property, damage to the environment, or a combination of these. |
| **Standard operating procedures (SOP)** | are also known as safe working procedures, safe operating procedures and standard working procedures. |
RANGE OF VARIABLES

Transport systems include capacities for personnel, equipment/materials and product and may be:
- wheeled
- railed
- skidded
- winding systems
- pneumatic lifting system
- slurry pumped
- conveyor system.

Wheeled transport may include but not be limited to:
- rubber tyred man transport
- multi purpose vehicles
- load haul dump
- forklifts
- front end loader
- skid steer loader.

Rail transport may include:
- locomotives (electric/diesel)
- rail mounted personnel carriers
- rolling stock
- inclined haulage systems.

Shaft winding systems may be for personnel, product and material and may comprise:
- head gear
- cages and skips
- winding apparatus and communications
- control system
- communications
- discharge and loading facilities
- drum winding engine
- friction winding engine
- counter balances
- services.

Conveyor system may include:
- conveyor belts
- drive heads
- tail ends transfer points
- surge bins
- fabricated bins.

Product slurry pumping may include:
- batching stations
- dewatering systems
- water reticulation pumping stations.

**Safety information and standards may be contained in:**
- legislation and regulations
- relevant International/Australian standards
- management plans
- health and safety policy
- codes of practice
- industry guidelines
- approved standards
- manufacturers' instructions
- standard operational procedures
- job instructions (or equivalent).

**Maintenance may be divided into:**
- predictive
- preventive
- breakdown.

**Site documentation and training policy may include but not be limited to:**
- statutory and legislative requirements
- management plans and procedures.

**Specifications may include, but not be limited to:**
- performance requirements
- costs
- dimensions
- capacity
- safety and health requirements
- training requirements
- key selection criteria.

**Management must comply with statutory/legal requirements. These may include:**
- environmental - noise/air/water
- quantities
- zonings
- boundaries
- processes
- royalties
- rehabilitation
- mineral resources or appropriate body
- safety and health authority
- environmental
- harbours and marine
- port authority.
Planning and development may include:

- interpreting and communicating information
- business/performance plans
- location
- tender specifications
- resources
- statutory/legal/organisational requirements and control
- resource parameters
- best practice
- technical standards established by industry and/or enterprise
- planning approvals
- surveying
- infrastructure/technology requirements and would typically incorporate the following specifications:
  * products
  * production rate
  * recyclable materials
  * hours per week of operation
  * waste and stockpiles
  * water management
  * transportation systems
  * safety and health/environmental
- all weather dust and noise levels/controls access/haul roads.

Management interaction/negotiation may be with but is not limited to:

- stakeholders
- regulatory authorities
- tenderers
- operating managers
- project managers
- contractors
- employees
- community
- suppliers
- customers
- State/Federal/Local Government.

Resources may include, but are not limited to:

- people
- buildings/facilities
- finance
- equipment
- power/energy
- technology
- information
- time.
1. **Context of Assessment**

The ultimate competency outcome is for the candidate to be able to establish underground mine product haulage and transport systems and, in so doing, to satisfy the performance criteria and underpinning knowledge requirements agreed by the industry in this Competency Unit.

Underground mine product haulage and transport requirements will differ markedly between mine sites. Therefore, there are limitations on the extent to which the practical establishment of mine product haulage and transport systems may be assessed in the workplace. To bridge this potential gap and to ensure the candidate is able to apply the extensive theory to a working situation, assessment is likely to include formal simulation exercises.

The assessment system for this competency is to cover the following:

A. **Theory and knowledge underpinning the competency which is a mandatory requirement**

B. **Application of theory to a generic practical situation/simulation which is a mandatory requirement**

**OR**

C. **Practical establishment of an underground mine product haulage and transport system or equivalent activity.**

There are special considerations in respect of Assessment C. It is unlikely that all candidates will be able, in terms of access, reasonable economic constraints and reasonable time frames, to physically establish all the mine's operational systems.

In most cases it would be reasonable to infer competency if a candidate has completed assessments A and B in respect of each required competency and has satisfied assessment C in respect of one of the required systems. This inference is based on the fact that a candidate, who has competently established one system, would be capable of establishing other systems if they have satisfied the theory and generic applications which form part of the required competencies.

Naturally, if this competency unit is being undertaken as a stand alone unit rather than as one within a qualification cluster, Assessment C is to be treated as a mandatory requirement.

2. **Inter-dependent Assessment of Units**

Whilst there are some common features between the units at this level, commonality is generally limited to science and engineering theory and the planning process. This unit requires the specialised application of knowledge. Generalised assessment is unlikely to satisfy the requirements of this unit or of the other allied units.

Unless inter-dependent assessment can be clearly demonstrated to satisfy the specialised requirements of each subject unit, and do so in a transparent and timely manner, the assessment should be on a unit by unit basis.
3. **Critical Aspects of Evidence.** The Industry has established that, for portability purposes, it is essential that competence in this unit reflects successful assessment in the critical aspects of:

- applying personal and operational safety and health procedures
- interpreting and communicating information on product haulage and transport systems
- identifying hazards and managing risks related to product haulage and transport systems
- applying mine design principles to minimise the likelihood of inappropriate product haulage and/or transport systems and equipment being sourced and commissioned
- evaluating and selecting product haulage and transport systems and equipment
- defining roles and responsibilities for management of product haulage and transport systems
- documenting product haulage and transport systems
- establishing statutory reporting procedures
- establishing and reviewing the related training program
- reviewing and auditing the effectiveness of the product haulage and transport system
- establishing and reviewing product haulage and transport system related emergency response procedures.

4. **Consistency of Performance.** Consistency of performance in this unit is aided by the standards of performance which are contained within State Legislation and by professional standards and practices established and observed by the Coal Industry. Mine product haulage and transport systems and their establishment are to meet Legislative and Industry standards.

5. **Underpinning Knowledge.** A knowledge of the listed topics/disciplines in sufficient scope and depth to enable the candidate to develop (or cause to be developed) and establish underground product haulage and transport systems.

**A knowledge of:**

- audit review processes and techniques
- computer based systems
- emergency response and evacuation planning processes and techniques
- fire fighting systems and precaution rules
- geological structures
- legislative and statutory requirements and instructions including transport rules, maintenance schemes, standard operating procedures, training, statutory testing on diesel vehicles, battery charging, underground fuel depots, conveyor belts.
- maintenance surveys
- mine design relating to product haulage and transport systems and equipment
- mine operation procedures
- mine plans
- mine reporting procedures
- power sources including electrical, hydraulic, pneumatic, diesel
• product haulage and transport systems and equipment statutory inspection requirements
• product haulage and transport systems equipment management requirements
• product haulage and transport equipment and systems; the types, uses, characteristics
  and limitations appropriate for safe operation at the mine site
• risk management procedures
• safety design features of product haulage and transport systems
• site environmental monitoring requirements.
• specification design criteria including noise, dust, lighting, ergonomics, remote control,
  physical clearance, confined space, visibility, seating vibration and machine equipment
  and personal protection
• stores system
• training and assessment systems.

UNDERPINNING SKILLS

6. The ability to:

• access, interpret and apply:
  - technical information
  - briefings and handover details
• assess the risks and consequences attached to product haulage and transport systems and
  equipment
• develop procedures appropriate to mine operations for management of product haulage
  and transport systems and equipment
• plan and coordinate work
• identify training needs related to product haulage and transport systems
• interpret and apply manufacturers' instructions
• conduct maintenance surveys.
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