



Australian Government

Department of Education, Employment and Workplace Relations

RIINHB316A Conduct underground in-seam directional drilling

Release: 1

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Modification History

Not applicable.

Unit Descriptor

This unit covers the conducting of underground in-seam directional drilling in coal mines. It includes planning and preparing for drilling, calibrating and operating survey tool, drilling holes, and completing documents, reports, equipment maintenance and housekeeping.

Application of the Unit

Underground in-seam directional drilling is conducted for gas extraction and water drainage, barrier proving and exploration in underground coal mining operations. This unit is appropriate for those working in driller roles, at worksites within:

- Coal mining
- Drilling

Licensing/Regulatory Information

Refer to Unit Descriptor.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

<p>Elements describe the essential outcomes of a unit of competency.</p>	<p>Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.</p>
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan and prepare for conducting of underground in-seam directional drilling	1.1. Access, interpret and apply compliance documentation relevant to the work activity 1.2. Obtain, confirm and apply work instructions for the allocated task 1.3. Identify, manage and report all potential hazards 1.4. Resolve coordination requirements with others at the site prior to commencing and during work activities
2. Calibrate and operate survey tool	2.1. Calibrate survey tool in accordance with instructions 2.2. Set up the orientation of the survey tool and the down-hole motor in accordance with instructions 2.3. Take the first survey reading in accordance with manufacturer's instructions and with regard to the standpipe length and composition and use the result to adjust the orientation of the down-hole motor 2.4. Conduct on-going surveys at intervals in accordance with the drill plan and use the result to adjust the orientation of the down-hole motor 2.5. Monitor and maintain the survey tool power supply and basic consumable items as per instructions
3. Drill hole	3.1. Prepare for drilling in accordance with the drill plan 3.2. Choose drill bits appropriate to the geology 3.3. Issue clear and timely instructions to drill team members and others involved, for the safe, effective and efficient conduct of the task, to meet the requirements of drill plan 3.4. Carry out the drilling in accordance with the drill plan 3.5. Monitor and adjust drilling technique according to conditions 3.6. Identify and remedy operational problems 3.7. Reorientate the down-hole motor when branching is required to achieved required

	<p>deviation of the hole</p> <p>3.8. Maintain communication with all <i>relevant personnel</i></p>
4. Complete documents and report	<p>4.1. Maintain drill log and plot drilling data</p> <p>4.2. Download survey instrument data system and upload data to site and/or work computer system</p> <p>4.3. Report data and drilling plots</p>
5. Complete equipment maintenance and housekeeping	<p>5.1. Ensure that the drill rods are inspected for wear and damage and that threads are dressed and greased in accordance with standard procedures or that rods are replaced as required</p> <p>5.2. Monitor all drill equipment and hoses and <i>ancillary equipment</i> and carry out <i>remedial action</i></p> <p>5.3. Monitor wear on drill bit and reamers and take appropriate action</p> <p>5.4. Apply health, safety and environmental controls</p> <p>5.5. Maintain safe and tidy site for the duration and at the conclusion of the job</p> <p>5.6. Ensure all drilling equipment is cleaned and maintained</p> <p>5.7. Ensure that drill fluids are appropriately contained and disposed of appropriately</p>

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

Specific skills are required to achieve the performance criteria in this unit, particularly for the application in the various circumstances in which this unit may be applied. This includes the ability to carry out the following as required to conduct underground in-seam directional drilling:

- apply legislative, organisation and site requirements and procedures for the conducting of underground in-seam directional drilling
- apply safe manual handling practices
- apply drill rig operating procedures
- apply survey equipment operating procedures
- apply drill bit, down-hole motor, and survey tool attaching procedures
- apply operational communication procedures
- apply inspection and monitoring procedures
- apply maintenance procedures
- interpret drill plans
- apply ancillary equipment operating procedures, including; communications equipment, computer equipment, pumps, ventilation equipment, separator pods and fluid mixers

Required knowledge

Specific knowledge is required to achieve the Performance Criteria of this unit, particularly its application in a variety of circumstances in which the unit may be used. This includes knowledge of the following, as required to conduct underground in-seam directional drilling:

- legislative, organisation's and site OHS requirements
- potential underground directional drilling hazards
- potential work place hazards
- potential underground environmental hazards
- principles of underground in-seam directional drilling operations
- organisation's operational requirements and procedures
- manufacturer's requirements and procedures
- specific handling requirements for underground drilling equipment
- housekeeping requirements and procedures
- basic geology types and their impact on underground in-seam directional drilling operations
- appropriate drill bits for different geology types
- appropriate reamers for different geology types
- importance and functions of the standpipe

- maximum radius of curvature for drill string
- types of drill fluid and their applications

Evidence Guide

<p>The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.</p>	
<p>Overview of assessment</p>	
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>The evidence required to demonstrate competency in this unit must be relevant to worksite operations and satisfy all of the requirements of the performance criteria, required skills and knowledge and the range statement of this unit and include evidence of the following:</p> <ul style="list-style-type: none"> • knowledge of the requirements, procedures and instructions for conducting of underground in-seam directional drilling • implementation of requirements, procedures and techniques for the safe, effective and efficient completion of conducting of underground in-seam directional drilling • working with others to undertake and complete the conducting of underground in-seam directional drilling that meets all of the required outcomes • consistent timely completion of conducting of underground in-seam directional drilling that safely, effectively and efficiently meets the required outcomes
<p>Context of and specific resources for assessment</p>	<ul style="list-style-type: none"> • This unit must be assessed in the context of the work environment. Where personal safety or environmental damage are limiting factors, assessment may occur in a simulated environment provided it is realistic and sufficiently rigorous to cover all aspects of workplace performance, including task skills, task management skills, contingency management skills and job role environment skills. • The assessment environment should not disadvantage the participant. For example, language, literacy and numeracy demands of assessment should not be greater than those required on the job. • Customisation of assessment and delivery environment to sensitively accommodate cultural diversity.

	<ul style="list-style-type: none"> • Aboriginal people and other people from a non English speaking background may have second language issues. • Assessment of this competency requires typical resources normally used in the work environment. Selection and use of resources for particular worksites may differ due to site circumstances. • Where applicable, physical resources should include equipment modified for people with disabilities. • Access must be provided to appropriate learning and/or assessment support when required.
<p>Method of assessment</p>	<p>This unit may be assessed in a holistic way with other units of competency. The assessment strategy for this unit must verify required knowledge and skill and practical application using more than one of the following assessment methods:</p> <ul style="list-style-type: none"> • written and/or oral assessment of the candidate's required knowledge • observed, documented and/or first hand testimonial evidence of the candidate's: <ul style="list-style-type: none"> • implementation of appropriate requirement, procedures and techniques for the safe, effective and efficient achievement of required outcomes • consistently achieving the required outcomes • first hand testimonial evidence of the candidate's: <ul style="list-style-type: none"> • working with others to undertake and complete underground in-seam directional drilling
<p>Guidance information for assessment</p>	<p>Consult the SkillsDMC User Guide for further information on assessment including access and equity issues.</p>

Range Statement

<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
<p>Relevant compliance documentation may include:</p>	<ul style="list-style-type: none"> • legislative, organisational and site requirements and procedures • manufacturer's guidelines and specifications • Australian standards • code of practice • Employment and workplace relations legislation • Equal Employment Opportunity and Disability Discrimination legislation
<p>Work instructions may come from:</p>	<ul style="list-style-type: none"> • briefings, handovers, plans and work orders and may be written or verbal, formal or informal and may include: <ul style="list-style-type: none"> • nature and scope of tasks • specifications • quality of finished works • achievement targets • operational conditions • obtaining of permits required • site layout • out of bounds areas • worksite inspection requirements • lighting conditions • plant or equipment defects • hazards and potential hazards • coordination requirements or issues • contamination control requirements • environmental control requirements • barricade and signage requirements
<p>Hazards may include:</p>	<ul style="list-style-type: none"> • mining equipment • roof and rib spalls • the presence of gases and water • release of gases or water from formation • spread of contaminants as a result of drilling or cleaning processes

	<ul style="list-style-type: none"> • working in proximity to drilling rig • use of high air or hydraulic pressure for drilling operations • entanglement in rotating pipes • string makeup and breakout hazards
Coordination requirements may include:	<ul style="list-style-type: none"> • drill team • other equipment operators • maintenance personnel • supervisors • mine personnel
Drill plan may include:	<ul style="list-style-type: none"> • hole location, dip and direction • hole sizes • hole depths • site geology • specific drill bits required • frequency of surveys • frequency of floor and or roof hits • coring requirements
Drill bits may include:	<ul style="list-style-type: none"> • PCD bits • tri-cone rock bits • tungsten bits
Instructions may include:	<ul style="list-style-type: none"> • likely geology • purpose of the drilling • survey intervals • hole parameters • in-hole drill component requirements
Monitor may include:	<ul style="list-style-type: none"> • gauge readings • colour and consistency of return water • down-hole motor penetration rate • vibration and noise levels
Drilling technique may include:	<ul style="list-style-type: none"> • applied feed pressure • rotational speed • regulation of water pressure and volume • use of drilling agents for stabilisation or to enhance flushing (e.g. bentonite, polymers or pH adjusting agents)
Conditions may include:	<ul style="list-style-type: none"> • variations in geology, including: <ul style="list-style-type: none"> • consistency of the coal • presence of stone (e.g. shale, sandstone) • presence of clay • faults and jointing

	<ul style="list-style-type: none"> • dykes • water and gas emissions from the drill face • variations in environmental conditions (e.g. ventilation)
Operational problems may include:	<ul style="list-style-type: none"> • changing geological formations, particularly clay, rock or unstable or porous formations • loss of air or water volume or pressure • equipment failure • bogging or parting of rod string • loss of signal from down-hole survey tool • reliability of communications
Relevant personnel may include:	<ul style="list-style-type: none"> • drill crew members • mine staff and supervisors • site safety personnel • statutory persons
Ancillary equipment may include:	<ul style="list-style-type: none"> • pumps • water disposal lines and • ventilation equipment
Remedial action may include:	<ul style="list-style-type: none"> • clear or remove obstructions • replace damaged hoses • top-up lubricants

Unit Sector(s)

Drilling (General)

Competency field

Refer to Unit Sector(s).

Co-requisite units

Not applicable.