Australian Government

RIINHB316X Conduct underground in-seam directional drilling

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Release: 1

RIINHB316X Conduct underground in-seam directional drilling

Modification History

Release	Comments
1	This unit of competency was first released in RII Resources and Infrastructure Industry Training Package Release 13.0.

Application

This unit describes the skills and knowledge required to conduct underground in-seam directional drilling. It covers planning and preparing for drilling, orientating and reorientating the down-hole motor to steer the hole in accordance with the drill plan, selecting drill bits to suit the geology, monitoring and adjusting drilling technique to suit ground conditions, completing drill logs and reporting survey and drilling data, and carrying out equipment maintenance and housekeeping.

The unit applies to those working in operational roles, such as underground drill operators, in underground coal mines where in-seam directional drilling is conducted for purposes including gas drainage and exploration ahead of workings.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite unit(s)

No pre-requisite units

Competency field(s)

N/A

Unit sector(s)

Coal mining

Drilling

Elements and Performance Criteria

1. Plan and prepare for underground in-seam directional drilling	1.1 Access, interpret and apply conduct underground in-seam directional drilling documentation and ensure the work activity is compliant

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	1.2 Obtain, read, interpret, clarify and confirm work requirements 1.3 Identify and address potential risks, hazards and environmental issues and implement control measures according to workplace procedures 1.4 Select and wear personal protective equipment appropriate for work activities 1.5 Communicate and coordinate activities with others throughout the work activity according to work requirements 1.6 Obtain and interpret emergency procedures, and be prepared for fire/accident/emergency
2. Drill hole	2.1 Prepare for drilling in accordance with the drill plan 2.2 Select drill bits to suit the geology being drilled according to manufacturer specifications 2.3 Issue instructions to drill team members and others involved according to work requirements 2.4 Identify, select and apply rig operational controls according to work requirements and manufacturer specifications 2.5 Carry out the drilling in accordance with the drill plan and according to workplace procedures 2.6 Monitor and adjust drilling technique to suit ground conditions encountered according to manufacturer specifications 2.7 Identify possible operational problems, determine possible causes and action required, and rectify within area of responsibility or report to designated person, according to workplace procedures 2.8 Reorientate the down-hole motor when branching is required to achieve required deviation of the hole 2.9 Continually monitor hazards and risks, and ensure safety of self, other personnel, plant and equipment according to workplace procedures
3. Complete documents and report	3.1 Maintain drill log and plot drilling data according to workplace procedures 3.2 Download survey instrument data system and upload data according to workplace procedures 3.3 Report data and drilling plots according to workplace procedures

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4. Complete equipment maintenance and housekeeping	4.1 Carry out shutdown procedures and secure equipment according to manufacturer specifications and workplace procedures 4.2 Confirm drill rods are inspected for wear and damage, and that threads are dressed and greased or rods replaced as required, according to manufacturer specifications 4.3 Monitor all drill equipment, hoses and ancillary equipment and carry out remedial action according to manufacturer specifications 4.4 Monitor wear on drill bit and reamers against wear limits and take required action according to manufacturer specifications 4.5 Confirm all drilling equipment is cleaned and maintained according to manufacturer specifications and workplace procedures 4.6 Confirm drill fluids are contained and disposed of according to workplace procedures 4.7 Confirm housekeeping activities are completed according to workplace procedures 4.8 Process records according to workplace procedures

Range of conditions

N/A

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Assessment Requirements for RIINHB316X Conduct underground in-seam directional drilling

Performance Evidence

The candidate must demonstrate the ability to complete the tasks outlined in the elements and performance criteria of this unit, including evidence of the ability to:

- conduct underground in-seam directional drilling to a drill plan on at least two occasions, with each occasion covering set-up, drilling, data reporting and shutdown, including:
    - preparing the rig for operation in accordance with the drill plan
    - interpreting survey data throughout the hole to monitor hole position against the drill plan, and reorientating the down-hole motor when branching is required
    - selecting drill bits and applying rig controls to suit the geology, and adjusting drilling technique as ground conditions change
    - responding to operational problems or changes in conditions, and rectifying or reporting them within area of responsibility
    - producing a drill log and drilling plots for each hole, and downloading and reporting survey data
    - shutting down and maintaining the rig, drill string and ancillary equipment, and completing housekeeping, including containment and disposal of drill fluids

During the above, the candidate must:

- interpret and apply drill plans, work requirements, relevant documentation and manufacturer specifications
- work safely in the underground environment, including:
    - identifying hazards and risks, and applying control measures, before and throughout the work
    - selecting and wearing personal protective equipment
    - applying safe manual handling practices
    - confirming emergency procedures before commencing work
- communicate effectively with others, including:
    - receiving and clarifying work instructions
    - issuing instructions to drill team members and coordinating activities with others before and during the work
    - reporting verbally and in writing according to workplace procedures

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Knowledge Evidence

The candidate must be able to demonstrate knowledge to complete the tasks outlined in the elements and performance criteria of this unit, including knowledge of:

- accessing, interpreting and applying the organisation and site requirements and procedures for:
    - work, health and safety
    - environmental issues
    - operating drill rig
    - housekeeping
- potential underground directional drilling hazards, and the reasons each arises in an underground in-seam environment
- the principles of underground in-seam directional drilling operations, including how the down-hole motor steers the hole and how survey data is interpreted to confirm hole position against the drill plan
- complying with the manufacturer's requirements and procedures
- specific handling requirements for underground drilling equipment
- basic geology types and seam structure, and their impact on penetration rate, steerability, hole stability and gas and water make in underground in-seam directional drilling operations
- how geology determines drill bit selection, and the consequences of selecting a bit unsuited to the ground being drilled
- how geology determines reamer selection, and the consequences of selecting a reamer unsuited to the ground being drilled
- the functions of the standpipe, how standpipe length and composition can affect the reliability of survey readings, and the consequences of standpipe failure
- the maximum radius of curvature for drill string, and the consequences of exceeding it for drill string integrity and hole alignment
- the types of drill fluid and their applications, and how ground and water conditions determine fluid selection
- the functions of drilling fluid in a steered in-seam bore, including cooling the bit, transporting cuttings along the hole, stabilising the hole and driving the down-hole motor, and the consequences of a loss of returns
- the relationship between fluid flow rate, hole diameter and drill rod diameter, and how these determine the removal of cuttings from a near-horizontal hole
- the consequences of inadequate hole cleaning, including increased drag, restricted rod retrieval and stuck drill string

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- indicators of changing ground conditions observable during drilling, including changes in penetration rate, thrust, rotation torque, fluid pressure, fluid return volume and the character of cuttings, and what each indicates about conditions at the bit
- common causes of departure from the drill plan, and the consequences of positional error for the drilling objective and for adjacent workings
- the reasons gas and water may be encountered during in-seam drilling, the indicators that each is being encountered, and the control measures applied
- the reasons in-seam directional drilling is conducted, including gas drainage and exploration ahead of workings, and how the purpose of the hole informs the drill plan
- being prepared for fire/accident/emergency

Assessment Conditions

The assessment must:

- include access to:
    - personal protective equipment
    - equipment required to conduct underground in-seam directional drilling operations
    - workplace documentation, drill plans, site plans and procedures, manufacturer instructions and safety data sheets
- be conducted in a safe environment
- be assessed in the context of this sector's work environment
- be assessed in compliance with relevant legislation/regulation and using policies, procedures and processes directly related to the industry sector for which it is being assessed
- confirm consistent performance can be applied in a range of relevant workplace circumstances.

Where personal safety or environmental damage are limiting factors, assessment may occur in a simulated work environment* provided it is realistic and sufficiently rigorous to cover all aspects of this sector's workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.

*Guidance on simulated environments has been stipulated in the RII Companion Volume Implementation Guide.

Industry Experts

An industry expert engaged by an RTO to wholly or partially conduct assessment, independently or together with another assessor, or be involved in an assessment judgement, must also satisfy the assessor requirements in applicable vocational education and training legislation, frameworks and/or standards.

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Assessors and industry experts delivering training in the drilling industry sector must also have a minimum of three (3) years industry experience, directly relevant to the training and assessment being provided.

Mandatory Workplace Requirements

Assessment of performance evidence may be in a workplace setting or an environment that accurately represents a real workplace.

Unit Mapping Information

Previous Code and Title	Equivalence	Comments
RIINHB316D Conduct underground in-seam directional drilling	Equivalent	Updates to application, elements and performance criteria, performance and knowledge evidence, and assessment conditions

Links

Companion volumes, including implementation guides, are found on the national training register - https://training.gov.au/training/details/RII.

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