Australian Government

RIINHB328X Conduct rotary air drilling

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Release: 1

RIINHB328X Conduct rotary air 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 rotary air drilling operations in drilling and related resources and infrastructure work environments.

It applies to operators conducting rotary air drilling using methods including blade, roller or tricone bit, polycrystalline diamond bit (PCD) and conventional hammer drilling. This unit does not apply to reverse circulation (RC) and down hole hammer drilling.

They generally perform tasks involving a broad range of skilled applications in a wide variety of contexts, which may involve some discretion and judgement in selecting equipment, services and contingency measures.

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

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Unit sector(s)

Drilling

Elements and Performance Criteria

Element	**Performance criteria**
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Plan and prepare for rotary air drilling	1.1 Access, review and apply drilling documentation, work instructions and site procedures, and confirm the work activity is compliant

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	1.2 Inspect and prepare work area according to site requirements 1.3 Identify, assess, manage and report hazards, risks and environmental conditions and implement required control measures 1.4 Confirm emergency procedures and exclusion zones according to site requirements 1.5 Select, inspect and wear personal protective equipment according to site requirements 1.6 Select and inspect tools, equipment, restraining and safety devices for serviceability and respond to conditions affecting safe operation within scope of own responsibility 1.7 Coordinate work activities with relevant personnel and confirm required briefing, and handover information is communicated and understood
2. Verify drilling requirements	2.1 Conduct pre-start inspection and start up operational checks in accordance with manufacturer specifications and workplace procedures 2.2 Identify and verify the required drill hole location using approved methods 2.3 Confirm hole identification, drilling method and related requirements before positioning the drill 2.4 Identify differences between the drilling plan, drill pattern and physical work area and report or rectify within scope of own role 2.5 Assess drill site layout, access, travel path, ground conditions, clearances, exclusion zones and interaction with personnel or equipment before drill setup
3. Establish drilling requirements	3.1 Activate drill onboard systems, complete operational checks according to manufacturer specifications 3.2 Select and confirm correct operating mode and confirm drilling parameters and operating limits meet manufacturer specifications and hole requirements 3.3 Position the drill according to drill plan using approved positioning, guidance or navigation methods 3.4 Level and stabilise the drill within site and manufacturer operating limits using applicable levelling, oscillation, jacking or stabilising systems

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	3.5 Select and measure the required rod or pipe, drill string components and drill bit to suit the hole requirements and ground conditions 3.6 Inspect the drill string components and drilling equipment for serviceability and compatibility before use and apply prescribed make up requirements 3.7 Prepare drilling systems for operation applicable to the drilling method 3.8 Confirm the drill, work area, drilling systems and exclusion controls are correctly established before commencing the drill hole
4. Conduct rotary air drilling	4.1 Collar the hole to suit ground conditions and meet drill plan and manufacturer requirements 4.2 Break out, add and remove drill pipe and bottom-hole assembly components using applicable pipe handling equipment to meet manufacturer and site requirements 4.3 Apply, monitor and adjust drilling operating parameters within authorised and manufacturer operating limits to achieve effective penetration while maintaining hole quality and equipment condition 4.4 Adjust hole cleaning parameters to achieve required hole clearance and effective removal of cuttings 4.5 Monitor indicators of machine, ground and hole condition throughout drilling and modify drilling techniques and operating parameters within authorised limits 4.6 Measure drill string components, calculate drill hole depth and monitor drilling progress against required hole specifications 4.7 Apply dust suppression and hole-cleaning methods appropriate to drilling conditions and site requirements 4.8 Identify and respond to abnormal drilling conditions and emergencies within scope of own responsibility 4.9 Complete drill hole according to required specifications, conduct required quality checks and protect completed drill hole 4.10 Record completed drill hole information using approved recording method
5. Carry out post-operational procedures	5.1 Carry out shutdown procedures and secure equipment according to manufacturer specifications and site requirements

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	5.2 Carry out serviceability checks, cleaning and housekeeping according to scope of own role, environmental requirements and site procedures 5.3 Complete record keeping and reporting requirements

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Assessment Requirements for RIINHB328X Conduct rotary air 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 rotary air drilling using a rotary air drill on at least two separate occasions in different ground conditions, with each occasion including:
    - preparing the work area, drill and drill string to suit the drilling plan, hole requirements and ground conditions
    - drilling and completing at least three holes to the drilling plan, required specifications and authorised tolerances, with at least one hole requiring drill string components to be added and removed
    - monitoring drill performance, ground and hole conditions, and adjusting drilling technique and operating parameters in response
    - completing drilling records for each hole drilled, and post-operational checks and housekeeping.

During the above, the candidate must:

- apply drilling documentation, site procedures and manufacturer requirements
- identify and control hazards, risks and environmental impacts, using required personal protective equipment
- work within the limits of own role and authorisation, and report matters outside those limits
- identify and respond to at least one abnormal drilling condition or equipment fault that affects drilling, hole quality or safe operation
- communicate and coordinate drilling activities with others, including giving and receiving briefing and handover information.

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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:

- drilling documentation, site procedures and manufacturer specifications that apply to rotary air drilling, including:
    - drilling plans, hole specifications, and authorised tolerances
    - emergency response procedures
- hazards, risks and environmental conditions associated with rotary air drilling, including:
    - compressed air, pressurised systems, and stored energy,

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    - rod or pipe handling and drill cuttings,
    - control measures, personal protective equipment and required reporting
- purpose of pre-start, start-up and shutdown checks and procedures, and the consequences of omitting or incorrectly completing them
- how blade, roller or tricone, PCD and conventional hammer drilling differ, and how the drilling method, hole requirements and ground conditions determine drill string, bit and operating parameter selection
- function, operating modes and limits of the drill and its onboard systems, and what warnings, alarms and fault messages indicate
- purpose of safety and restraining devices, and the consequences of operating with them unserviceable or bypassed
- purpose and limitations of drill guidance and positioning systems, and why displayed information must be verified against the drilling plan and physical conditions
- how site layout, access, ground conditions, exclusion zones and interaction with personnel or equipment affect work area preparation and drill setup
- how drill position, levelling and stabilising affect hole location and quality, and why setup must remain within manufacturer operating limits
- when differences between the drilling plan and the work area, or changes outside approved tolerances, must be reported or authorised
- indicators of unserviceable or incompatible drill string components and threads, and the consequences of incorrect make-up
- why controlled collaring is needed to establish hole position and direction
- how feed, rotation, pull down, holdback, air pressure and airflow interact, and how they are adjusted to maintain penetration, hole quality and equipment condition
- what drill response, operating pressures, returns and cuttings indicate about ground, hole, drill string and bit condition, and how hole cleaning and dust suppression are adjusted in response
- how drill hole depth and quality are measured and confirmed, and the causes and reporting of hole deviation and other non-conformance
- requirements for recording and protecting completed drill holes
- indicators of abnormal and emergency situations during drilling, including restricted returns and blockages, and the response required within scope of own role
- information that must be communicated during briefings, coordination of work activities and handover, and why
- operator responsibilities for serviceability checks, cleaning and housekeeping, and when faults must be escalated.

Assessment Requirements

Mandatory conditions for assessment of this unit are stipulated below. The assessment must:

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- include access to:
    - personal protective equipment
    - equipment required to conduct rotary air drilling
    - workplace documentation such as, 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.

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.

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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
RIINHB328 Conduct rotary air drilling	Equivalent	Updates to application, elements and performance criteria, performance and knowledge evidence, and assessment conditions

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Links

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

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