



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **RIIOGD403A Conduct drilling operations**

**Release: 1**

## RIIOGD403A Conduct drilling operations

### Modification History

Not applicable.

### Unit Descriptor

This unit covers the conduct of drilling operations in the drilling industry. It includes planning and preparing for drilling operations, commencing drilling operations, maintaining drilling operations, drilling intermediate and/or main holes, and preparing for hole abandonment. Licensing, legislative, regulatory and certification requirements that apply to this unit can vary between states, territories, and industry sectors. Relevant information must be sourced prior to application of the unit.

### Application of the Unit

This unit is appropriate for those working in a supervisory role or as a technical specialist, at worksites within:

- 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

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| Elements describe the essential outcomes of a unit of competency. | 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. |
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## Elements and Performance Criteria

| ELEMENT                                     | PERFORMANCE CRITERIA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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| 1. Plan and prepare for drilling operations | 1.1. Access, interpret and apply <b>compliance documentation</b> relevant to the work activity<br>1.2. Obtain, confirm and apply <b>work instructions</b> for the allocated task<br>1.3. Identify, manage and report all potential <b>hazards</b><br>1.4. Communicate emergency response and occupational health and safety requirements, including the possibility of wellbore influx and well control, to crew members<br>1.5. Resolve and maintain <b>coordination requirements</b> with others at the site prior to commencing and during work activities<br>1.6. Check, clean and lubricate <b>equipment</b> , including mud riser/conductor/connections and rectify and report faults<br>1.7. Check tool requirements and assembled in wellhead area |
| 2. Commence drilling operations             | 2.1. Double-check drilling program requirements to ensure safe operations<br>2.2. Undertake surface hole drilling in accordance with Job Safety Analysis (JSA) and drilling program, and confirm with operator's representative<br>2.3. Commence intermediate and main hole drilling operations<br>2.4. Monitor, maintain and <b>record</b> drilling parameters in line with drilling program<br>2.5. Calculate and maintain kill sheet requirements and carry out and record integrity tests in line with drilling program<br>2.6. Maintain accurate tubular tallies<br>2.7. Inspect and prepare casing running tools and casing for operation                                                                                                            |
| 3. Maintain drilling operations             | 3.1. Undertake cementing preparations in accordance with operator's instructions and company procedures<br>3.2. Run casing and prepare for cementing in accordance with job safety analysis, and cement in accordance with well engineering                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

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|                                         | <p>prognosis</p> <p>3.3.Undertake preparations, and give assistance in drilling stem tests and logging and coring operations</p> <p>3.4.Instruct crew on safe core recovery procedures</p> <p>3.5.Put arrangements in place for nippling-up and drilling out</p>                                                                               |
| 4. Drill intermediate and/or main holes | <p>4.1.Confirm drilling program/timing schedule and comply with procedures</p> <p>4.2.Check equipment and tools for sizing and integrity with faults being rectified/reported</p> <p>4.3.Maintain hole within deviation limits</p> <p>4.4.Adhere to sound drilling and safety practices during nippling-up and pressure testing operations</p> |
| 5. Prepare for hole abandonment         | <p>5.1.Confirm program for completion or abandonment with operator representative</p> <p>5.2.Check tools/equipment for integrity and record and report faults</p> <p>5.3.Complete appropriate <b>communication</b> and recording requirements to regulations and company policies/procedures</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 of this unit, particularly for its application in the various circumstances in which this unit may be used. This includes the ability to carry out the following, as required to conduct drilling operations:

- apply legislative, organisation and site requirements and procedures for conducting drilling operations
- operate rig in a safe and productive manner
- delegate work to individuals according to established levels of skill
- administer effective communication skills - oral and written
- troubleshoot and problem solve, including rise in rotary torque and mud pressure
- forward planning in preparation of changing circumstances/contingencies
- use a calculator and convert from metric to imperial measurements
- shutdown the rig in an emergency and coordinate an orderly evacuation if necessary
- perform calculations including:
  - quantities
  - up-hole velocity
  - specific gravity
  - volumes and capacities
  - pressure calculations

### Required knowledge

Specific knowledge is required to achieve the Performance Criteria of this unit, particularly for its application in the various circumstances in which this unit may be used. This includes knowledge of the following, as required to conduct drilling operations:

- rig components
- rig specifications
- hole recovery procedures, including fishing, assembly service maintenance and tools
- potential problems
- down hole conditions
- types of mud available
- rigging and slinging
- rig maintenance procedures
- evacuation procedures



## Evidence Guide

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.

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| <b>Overview of assessment</b>                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Critical aspects for assessment and evidence required to demonstrate competency in this unit</b> | <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"> <li>• knowledge of the requirements, procedures and instructions for conducting drilling operations</li> <li>• implementation of requirements, procedures and techniques for the safe, effective and efficient completion of drilling operations</li> <li>• working with others to plan, prepare and conduct drilling operations</li> <li>• evidence of the consistent successful conduct of drilling operations</li> </ul>                                                                                                                                                                                                                                                                       |
| <b>Context of and specific resources for assessment</b>                                             | <ul style="list-style-type: none"> <li>• 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.</li> <li>• Assessment of this competency requires typical resources normally used in a resources and infrastructure sector environment. Selection and use of resources for particular worksites may differ due to the site circumstances.</li> <li>• 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.</li> <li>• Customisation of assessment and delivery environment to sensitively accommodate cultural diversity.</li> </ul> |

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|                                            | <ul style="list-style-type: none"> <li>• Aboriginal people and other people from a non English speaking background may have second language issues.</li> <li>• 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.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Method of assessment</b>                | <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"> <li>• written and/or oral assessment of the candidate's required knowledge</li> <li>• observed, documented and/or first hand testimonial evidence of the candidate's:             <ul style="list-style-type: none"> <li>• implementation of appropriate requirement, procedures and techniques for the safe, effective and efficient achievement of required outcomes</li> <li>• consistent achievement of required outcomes</li> </ul> </li> <li>• first hand testimonial evidence of the candidate's:             <ul style="list-style-type: none"> <li>• working with others to undertake and complete drilling operations</li> <li>• provision of clear and timely instruction and supervision by the individual of those involved in the conduct of drilling operations</li> </ul> </li> </ul> |
| <b>Guidance information for assessment</b> | Consult the SkillsDMC User Guide for further information on assessment including access and equity issues.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

## Range Statement

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.

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| <p><b>Relevant compliance documentation</b> may include:</p>                                                                                                | <ul style="list-style-type: none"> <li>• legislative, organisational and site requirements and procedures including: <ul style="list-style-type: none"> <li>• Job Safety Analysis (JSA)</li> <li>• environmental guidelines</li> <li>• specifications</li> <li>• operator's instructions</li> <li>• drilling program</li> <li>• technical information</li> <li>• Petroleum Act</li> <li>• daily pre-tour checklist</li> <li>• daily pre-drilling checklist</li> <li>• Job Sheet Analysis (JSA)</li> <li>• API RP 53</li> <li>• API RP 59 (if applicable)</li> <li>• site specific manual</li> </ul> </li> <li>• manufacturer's guidelines and specifications</li> <li>• Australian standards</li> <li>• code of practice</li> <li>• Employment and workplace relations legislation</li> <li>• Equal Employment Opportunity and Disability Discrimination legislation</li> </ul> |
| <p><b>Work instructions</b> may come from briefings, handovers, plans and work orders and may be written or verbal, formal or informal and may include:</p> | <ul style="list-style-type: none"> <li>• discussing and confirming drill program requirements with crew members</li> <li>• pre-job requirements</li> <li>• drilling parameters, which may include: <ul style="list-style-type: none"> <li>• surveys</li> <li>• pressure testing</li> <li>• conditioning the hole</li> <li>• circulating and penetration rates</li> <li>• mud properties</li> </ul> </li> <li>• BHA performance parameters, which may include, make-up torque</li> <li>• ancillary operation, which may include:</li> </ul>                                                                                                                                                                                                                                                                                                                                      |

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|                                                                                  | <ul style="list-style-type: none"> <li>• logging</li> <li>• cementing</li> <li>• rig-up operations</li> <li>• pre-tour safety meeting</li> <li>• safety meeting/briefing</li> <li>• handover with oncoming driller</li> <li>• maintaining records including: <ul style="list-style-type: none"> <li>• tour sheet</li> <li>• API metric tour report</li> <li>• kill sheet</li> <li>• incident report form</li> <li>• drilling line record sheet</li> <li>• shut-in procedures</li> <li>• weekly safety meeting report</li> <li>• pre-tour safety meeting report</li> <li>• warning/counselling record</li> <li>• equipment damage report</li> </ul> </li> <li>• taking remedial action including alteration to drilling program as approved by operator's representative via operator company head office</li> <li>• nature and scope of tasks</li> </ul> |
| <b>Hazards</b> may include:                                                      | <ul style="list-style-type: none"> <li>• working in proximity to drilling rig</li> <li>• working in different conditions including:</li> <li>• night time operations <ul style="list-style-type: none"> <li>• day time operations</li> <li>• hot climates</li> <li>• cold climates</li> <li>• wet weather conditions</li> <li>• high wind</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Coordination requirements</b> may include instructing and communicating with: | <ul style="list-style-type: none"> <li>• drill crew</li> <li>• other equipment operators</li> <li>• maintenance personnel</li> <li>• contractors</li> <li>• supervisors</li> <li>• site personnel</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Equipment</b> may include:                                                    | <ul style="list-style-type: none"> <li>• wellhead equipment</li> <li>• casing centraliser and nails</li> <li>• thread lubricant</li> <li>• cement plugs</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

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|                                                                        | <ul style="list-style-type: none"><li>• cement mix chemicals</li><li>• bottom hole assembly (BHA)</li><li>• tubulars</li><li>• mud equipment</li></ul>                                                       |
| <b>Records</b> may include:                                            | <ul style="list-style-type: none"><li>• WIP sheets</li><li>• WIP volumes</li><li>• Kill sheets</li><li>• Slow circulation rates (SCR)</li></ul>                                                              |
| <b>Communication</b> may be via a range of channels which may include: | <ul style="list-style-type: none"><li>• 2-way radio</li><li>• hand signals</li><li>• telephone</li><li>• public address system</li><li>• written work instructions</li><li>• intranet and internet</li></ul> |

## Unit Sector(s)

Drilling (Oil and Gas)

## Competency field

Refer to Unit Sector(s).

## Co-requisite units

Not applicable.