



Australian Government

Department of Education, Employment and Workplace Relations

RIIOGD405A Carry out well control and blow out prevention

Release: 1

RIIOGD405A Carry out well control and blow out prevention

Modification History

Not applicable.

Unit Descriptor

This unit covers the carrying out of well control and blow out prevention in the drilling industry. It includes: managing well control strategies; assessing well control equipment and reporting and recording faults; and carrying out well kill operations.

Application of the Unit

This unit is appropriate for those working in supervisory or technical specialist roles, in coal-seam methane gas drilling operations 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

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.
---	--

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Manage well control strategies	1.1. Access, interpret and apply compliance documentation relevant to the work activity 1.2. Identify hazards, and assess and manage risks associated with well control operations under varying working conditions 1.3. Calculate mud weight, pressure losses, drill stem and annular volumes, MAASP and initial and final circulating pressures 1.4. Identify interpret and respond to the early warning signs of kicks and well going under-balance while drilling 1.5. Recognise kick indicators and apply kick detection methods and responses during well control operations
2. Assess well control equipment and report and record faults	2.1. Identify the purpose, use and relationship between equipment, indicators, counters and detection systems to determine fitness of equipment for well control. 2.2. Identify flow paths for normal drilling operations and well control from appropriate sources 2.3. Identify and apply well-control testing procedures and principles in accordance with company/regulatory requirements 2.4. Perform primary equipment failure well shut-in procedures in accordance with company/regulatory requirements 2.5. Conform to safe working practices and operational requirements
3 Carry out well kill operations	2.6. Brief crew on well control procedures 2.7. Identify and apply appropriate pre-recorded information. 2.8. Check, read, interpret and record pressures and gauges and undertake corrective action 2.9. Determine and apply well kill procedures 2.10. Demonstrate correct application of trip kill sheet data and well-closure procedure when dealing with influx and shutting in a well 2.11. Calculate hydrostatic head at

	specific depths, and apply correct procedure when observing loss of circulation. 2.12. Perform correct tripping methods and tests in accordance with company/regulatory requirements. 2.13. Apply stripping methods in accordance with operating requirements. 2.14. Apply recording and reporting procedures in accordance with regulations and company policies/procedures 2.15. Manage and communicate with crew during well control incident
--	--

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 carry out well control and blow out prevention:

- apply legislative, organisation and site requirements and procedures
- work in a team
- take measurements such as:
 - penetration rate
 - circulating pressure
 - rotary torque
 - active surface volume
 - frequency
 - pump pressure
- make calculations and estimations such as:
 - pressure
 - density
 - volume
 - height
 - velocity
 - length
 - weight
- interpret gauges, graphs
- detect kick warning signs and indicators
- complete trip sheets
- complete kill sheets

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 carry out well control and blow out prevention:

- risk management related to well control
- well control procedures and their application
- function, operation, maintenance and use of well control and auxiliary equipment
- causes, effects and response to equipment failures
- drilling parameters and their interpretation

- measuring and testing device purpose and operation
- calculations necessary for well control procedures
- kick detection warnings and indications and the responses to them
- kill methods and procedures
- managing well control crew requirements
- well control emergency drills
- effects of swabbing and surging
- pressure concepts and effects
- formation integrity
- influx parameters
- safe well shut-in procedures
- tripping requirements and techniques
- constant bottom hole pressure method
- accumulator
- type, format and implementation of well control documentation

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.

Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	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: • knowledge of the requirements, procedures and instructions for the carrying out of well control and blow out prevention • implementation of appropriate procedures and techniques for the safe, effective and efficient well control and blow out prevention • working with others to plan, prepare and conduct well control and blow out prevention • provision of clear and timely instruction and supervision by the individual of those involved in carrying out of well control and blow out prevention • evidence of the consistent successful well control and blow out prevention
Context of and specific resources for assessment	• 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.

	• 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 a resources and infrastructure sector environment. Selection and use of resources for particular worksites may differ due to the 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.
Method of assessment	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: • written and/or oral assessment of the candidate's required knowledge • observed, documented and/or first hand testimonial evidence of the candidate's: • implementation of appropriate procedures and techniques for the safe, effective and efficient achievement of the required outcomes • consistently achieving the required outcomes • first hand testimonial evidence of the candidate's: • working with others to plan, prepare and conduct well control and blow out prevention • provision of clear and timely instruction and supervision by the individual of those involved in the conduct of the well control and blow out prevention
Guidance information for assessment	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.

Relevant compliance documentation may include:	• legislative, organisation 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
Hazards may include:	• blow out gas to surface • ignition of gas • toxic gases • pressurised coal seam gas system
Working conditions may include:	• night time operations • day time operations • hot climates • cold climates • snow • wet weather conditions • high wind
Early warning signs may be:	• rate of penetration trends • drilling break • trends shown in torque/drag
Kick indicators may include:	• flow from wells (pump off) • increase in flow from well (pumps on) • pit volume gain
Equipment may include:	• mud system • blow out preventer • manifolds and chokes • accumulator • degassers • monitors • diverters
Well-control testing procedures	• to be identified

may include:	
Working practices may include:	• industry best practice • confirmation of shut-in • monitoring of shut-in pressures • monitoring of accumulator pressures • correct SPM to be maintained during kill • monitoring pump efficiency • individual operation • team operation • use of personal protective equipment • consideration of H₂S and other toxic substances • consideration of flammables and ignition sources • maintaining continuous communication • reacting to on-site emergencies
Briefing of crew may include:	• time of well shut-in • initial shut-in pressures • kill sheets • stage of kill • type of kill procedure employed • status of well control equipment • flow path for well control method • safety briefing/induction • pre-tour safety meeting • weekly safety meetings • job safety analysis (JSA) • agreed procedures including: • company • facility • client
Corrective action may include:	• changing over pumps in the event of primary failure • using secondary choke in the event of primary failure • using alternate preventer in the event of primary failure • running accumulator emergency backup in case of primary failure
Operational instructions may include:	• type of kill procedure to use • type of shut-in procedure to use • action to be taken in the event of approaching

	MAASP • monitoring pit levels
Recording and reporting documents may include:	• specifications • operator's instructions • drilling program • technical information • relevant legislation • industry regulations • government requirements • daily pre-tour checklist • daily pre-drilling checklist • AP RP 53 • tour sheet • tour reports and drilling logs • kill sheet • incident report form • drilling line record sheet • shut-in procedures • weekly safety meeting report • equipment damage report
Managing crew during well control incident may include:	• informing subordinates of their roles and responsibilities in a well control situation • observing and reacting on the performance of subordinates that falls below acceptable levels • assessing crew performance to ensure competent handling of well control situations • communicating potential problems to the crew and taking necessary actions • instructing the crew to take up their assigned positions during well kill • allocating personnel assignments to increase the fluid density and handle the resulting increased volumes during the well kill
Communication channels may include:	• 2-way radio • hand signals • telephone • public address system • written work instructions • internet and intranet

Unit Sector(s)

Drilling (Oil and Gas)

Competency field

Refer to Unit Sector(s).

Co-requisite units

Not applicable.