Technical Oil & Gas Training

Online Courses 2019
Introduction

Norwell EDGE provides a flexible approach to technical oil & gas training for teams around the globe. Our digital modules can be combined to create a training programme that meets your specific needs.

Each module, sub-module and assessment has been created by experienced industry professionals in line with Oil and Gas UK’s guidelines on competency for wells personnel. They range from well design to operations, subsurface and advanced courses. All of which are designed to meet core skills gaps.

Our courses include an Awareness and Application level ideal for those working in technical, operational and supporting roles that need to develop core competencies, and a comprehensive Advanced level designed for senior personnel and critical project teams.

We’re committed to breaking down barriers to quality oil & gas training by ensuring our courses are affordable, accessible and the content is always available to users - even after they’ve completed the course. We work in a spirit of open collaboration to create an energy industry that is safer, more effective, and sustainable.

Use this guide to learn more about our online modules which are accessed via the EDGE Learning Management System from any Wi-Fi connected device including PC, tablet, laptop or smartphone.

Employers can track progress, while individuals will retain permanent access to completed modules, enabling them to build a wealth of valuable reference material.

Get in touch with us today to discuss your training requirements or to arrange a free trial: info@norwelledge.com

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It’s encouraging to work with a company like Norwell EDGE who echo our value for quality, integrity, service excellence and capacity development.”

Ken Etete  CEO, Century Group
### Well Planning

<table>
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<tr>
<th>Course Name</th>
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<th>Learning Focus</th>
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<tbody>
<tr>
<td>Conceptual Design</td>
<td>This module provides learners with knowledge of the Offset Well Review and Conceptual Well Design steps that are critical to all exploration, appraisal and field development operations.</td>
<td>• Importance of Data Gathering and Offset Review&lt;br&gt;• Overview of Conceptual Well Design The use of pore pressure, fracture gradient and kick tolerance</td>
</tr>
<tr>
<td>Time and Cost Estimation</td>
<td>This module will give learners a grasp of the main features of well time and cost estimation, including their importance in well planning.</td>
<td>• Key factors affecting well timings&lt;br&gt;• Tangible and intangible costs associated with well operations&lt;br&gt;• Understand systems for managing well costs</td>
</tr>
<tr>
<td>Material Procurement</td>
<td>In this module Material Procurement is explored, giving learners an understanding of the tendering process and how materials and services are selected.</td>
<td>• Understands the tendering process&lt;br&gt;• The key information needed to procure well materials and services&lt;br&gt;• What the key materials and services are</td>
</tr>
<tr>
<td>Detailed Drilling Programmes</td>
<td>This module provides learners with an understanding of the Detailed Drilling Programme, why this is important and what goes into its preparation.</td>
<td>• The purpose and role of the Detailed Drilling Programme&lt;br&gt;• Understand the content and composition – what is included, and why</td>
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### Subsurface

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<tr>
<th>Course Name</th>
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<tbody>
<tr>
<td>Geophysics</td>
<td>In this module we explore the methods used to study the earth, with emphasis on the most widely used in the oil and gas industry such as seismic surveying. Learners will be given the fundamental knowledge needed to understand and engage with Geophysical concepts.</td>
<td>• Principles of geophysical methods&lt;br&gt;• Impact of method on survey design&lt;br&gt;• Geophysical data processing&lt;br&gt;• Interpretation of geophysical data&lt;br&gt;• Geophysical data acquisition in the oil and gas industry</td>
</tr>
<tr>
<td>Petrophysics</td>
<td>Whereas Geophysics looks at the larger geological structures, Petrophysics concerns the physical properties of the reservoir rock and fluid. This module explores petrophysical properties, logging and interpretation.</td>
<td>• Petrophysics and our understanding of the subsurface&lt;br&gt;• The main petrophysical reservoir properties&lt;br&gt;• Wirelogging logging tools&lt;br&gt;• Petrophysical interpretation of logs&lt;br&gt;• Shaly sands</td>
</tr>
<tr>
<td>Reservoir Engineering</td>
<td>The objective of Reservoir Engineering is to optimise future production at the field design stage. In this module learners will explore how Reservoir Engineering is applied in the oil &amp; gas sector, from modelling to recovery.</td>
<td>• Key reservoir properties and classification&lt;br&gt;• Reservoir fluids and fundamental properties&lt;br&gt;• Reservoir lifecycle and recovery process&lt;br&gt;• Reservoir simulation and modelling&lt;br&gt;• Classification of reserves</td>
</tr>
<tr>
<td>Geomechanics</td>
<td>Geomechanics is the study of how rock behaves during the course of a well’s life. This module provides an understanding of the fundamentals of Geomechanics from earth stress to pore pressure.</td>
<td>• How log data is used in strength modelling&lt;br&gt;• The value of core&lt;br&gt;• Building a stress model&lt;br&gt;• Stress orientation&lt;br&gt;• Pore pressure estimation</td>
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"Making upstream training accessible and affordable will bridge the knowledge gap and create a level the playing field."  
Gideon Marshall Kibirige  President, Makerere University
Well Engineering

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<tbody>
<tr>
<td>Shallow Gas</td>
<td>1 hour</td>
<td>Shallow gas can pose a high risk to oil &amp; gas operations. In this module learners will understand the key features, risks and mitigations of shallow gas.</td>
</tr>
<tr>
<td>Pore Pressure</td>
<td>1 hour</td>
<td>In this module the fundamental aspects of Pore Pressure are discussed, giving learners an understanding of the various pressure states and how these are predicted.</td>
</tr>
<tr>
<td>Fracture Gradient</td>
<td>1 hour</td>
<td>Fracture gradient is a key concept in well design and operations, throughout the life of a well. This module provides learners with this essential core knowledge.</td>
</tr>
<tr>
<td>Hydrostatics</td>
<td>1 hour</td>
<td>This module aims to give learners a grounding in Hydrostatics and the importance of this concept in all oil &amp; gas operations.</td>
</tr>
<tr>
<td>Formation Fluids</td>
<td>1 hour</td>
<td>In this module learners will explore how Formation Fluids are formed, how they accumulate and how they affect well design and operations.</td>
</tr>
<tr>
<td>Formation Temperature Analysis</td>
<td>40 minutes</td>
<td>Formation temperatures change the way wells are designed, how equipment and fluids interact and the efficiency of operations. This module provides the fundamental core knowledge needed by upstream teams.</td>
</tr>
<tr>
<td>Drilling Fluids</td>
<td>3 hours</td>
<td>Drilling fluid is needed to successfully drill, test, complete and produce a well. In this module learners will be given the knowledge needed to understand the core principals of drilling fluids in modern oil &amp; gas.</td>
</tr>
<tr>
<td>Drilling String</td>
<td>2.5 hours</td>
<td>The drillstring is the central component of the drilling process. In this module the concept of the drillstring is explored, discussing the equipment, design and limitations of modern well design.</td>
</tr>
<tr>
<td>Casing Seat Selection</td>
<td>1 hour</td>
<td>In this module learners will explore how casing setting depths are accurately planned, engineered and selected. The factors that affect casing seat selection and the role that kick tolerance plays.</td>
</tr>
<tr>
<td>Casing and Tubing Design</td>
<td>3 hours</td>
<td>Casing design is fundamental to all oil &amp; gas wells. In this module learners will explore the key concepts of the design process from load cases to wear and fatigue.</td>
</tr>
<tr>
<td>Wellhead and Xmas Tree Selection</td>
<td>1 hour</td>
<td>In this module the features, limitations and design of modern wellheads and xmas trees are introduced including the differences between surface and subsea, and how they are selected.</td>
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Well Engineering

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</table>
| **Well Test Planning**    | Planning and testing is an essential process in the evaluation of a potential reservoir. In this module, we explore the fundamental concepts of well testing, how they are designed, planned and performed. | • The types of well test and why they are performed  
• Well test planning and equipment selection  
• How well tests are performed, how the reservoir is accessed and how data is collected |
| **Completion Design**     | Completions are essential in the production of oil & gas. In this module, learners will gain an understanding of what is required during the design and operational phases of a well completion. | • How well types influence Completions  
• Completion design requirements  
• Tubing string design and stress analysis  
• Completion equipment selection |
| **Abandonment and Barriers** | Well abandonment and well barriers are key to ensuring well integrity. In this module, we discuss the purpose and goals of the suspension and abandonment process and the various requirements of competent well barriers. | • Understand the purpose and goals of suspension and abandonment  
• Competent Well Barriers and core requirements, verification and practices |

**Norwell EDGE**

Our goal is to make upstream training accessible and affordable for everyone in our industry - allowing more people than ever before to undertake continual professional training, throughout their careers.  

Mike Adams  | Co-founder, Norwell EDGE.

I already have four certificates with Norwell EDGE and I’m growing with the platform all the time. If you’re interested in oil & gas, Norwell EDGE provides the best training.”

Lonku Emmanuel El  | EDGE User
## Drilling & Completions

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</table>
| Drilling Procedures 2 hours         | Drilling is a complex process that requires significant planning, design and expert execution. In this module, learners will explore common drilling procedures and how they are applied to specific operations. | • Common drilling procedures for each phase of a well  
• Understand best practice during tripping operations  
• Prevention and response tactics to common drilling problems  
• Fishing and milling operations |
| Drilling Operations 3 hours         | Successful drilling operations are the focus of Operators and Service Companies alike. In this module, learners will explore the key aspects of drilling operations, common problems and how to address them. | • Understand the roles and responsibilities of wellsite personnel  
• Gain an understanding of the critical elements of each operation  
• Learn how common hole problems can be handled |
| Formation Evaluation 3 hours        | Well logging is an essential part of the data gathering process. In this module, we explore the planning and management of open-hole logging, logging tools and logging operations. | • Methods of log data acquisition  
• Planning and management of logging operations  
• Measurement and control |
| Well Testing and Completions 2.5 hours | In this module, we discuss the fundamental aspects of well testing and completion operations including methods, equipment and operations. | • Well testing operations and objectives  
• Completion installation operations  
• Well workovers |
| Drilling and Rig Equipment 2 hours   | A wide range of equipment is used during drilling. In this module, learners will gain an understanding in the critical pieces of rig and third party equipment used during drilling operations. | • Understand the main items of equipment on the drilling rig  
• Explore common third party equipment |
| Well Control Equipment 2 hours      | Well control equipment is essential to the mitigation of risk and safe handling of well control incidents. This module provides learners with an understanding of well control equipment and how they are operated. | • Understand the main components and operations of a BOP  
• The diverter system and how it operates  
• The surface equipment used for kick detection and mud gas separation  
• Awareness of drillstring well control equipment |

## Logistics

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| Well Control Procedures 1 hour      | Competent procedures are essential in tackling well control incidents. In this module, we explore what leads to a loss of well control, how this is detected and ultimately controlled. | • Causes of kicks and kick avoidance  
• Kick detection and response  
• Shut in procedures and principal well control techniques |
| Land Rigs 1.5 hours                  | Land rigs are portable onshore drilling rigs used to explore for, appraise and develop hydrocarbon assets. This module explores the types of land rig and the best practice for common operations. | • The main types of land rig  
• Common best practice operations |
| Jack-up Rigs 1.5 hours               | Jack-ups are versatile and commonly used offshore rigs. In this module, learners will gain an understanding in jack-up construction, key systems, design and operations. | • Understand the design principles and considerations behind a Jack-up rig  
• Equipment and components unique to Jack-ups  
• The design, operations and operational risks common to Jack-ups |
| Moored Rigs 1 hour                  | Mooring is a critical operation for many rigs and vessels. In this module, we explore how mooring works, the main equipment, planning and operational requirements. | • Understand how a moored rig holds its position  
• Learn about the components of the mooring system and how anchors are placed  
• Understand the significance of site surveys and seabed analysis |
| Dynamically Positioned Rigs 1 hour   | Many modern rigs utilise dynamic positioning systems. In this module, we explore the differences between DP and Moored vessels, how a DP system works and the key operations. | • Understand the advantages and disadvantages of DP rigs  
• Learn about the technology and various components behind a DP system  
• Understand the concepts behind watch circles and drift/drive offs |
| Project Logistics 2 hours            | Logistics is a fundamental part of every oil & gas project. It involves the complex process of planning for, shipping and ensuring delivery of equipment, machinery, chemicals, bulk products, material and personnel. In this module, learners will understand the roles, responsibilities and operations involved in upstream project logistics. | • Understands the roles and responsibilities involved in project logistics and the operational supply chain  
• Knowledge of the common operations of the upstream logistics supply chain |
Drilling & Completions

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<tbody>
<tr>
<td>Waste Management</td>
<td>Upstream operations generate waste. This module explores the various elements that might be considered waste, how they are dealt with both onshore and offshore, and the importance of appropriate planning.</td>
<td>• The main categories of waste generated onshore and offshore&lt;br&gt;• The process of drilling fluids solids removal and the equipment involved&lt;br&gt;• Overview of cuttings disposal and waste management planning</td>
</tr>
<tr>
<td>Emergency Planning, Safety and the Environment</td>
<td>There are a range of high risk activities undertaken during upstream operations. This module deals with the emergency response planning and procedures that should be in place for upstream operations.</td>
<td>• Major hazards and mitigation&lt;br&gt;• Oil spill planning and response&lt;br&gt;• A ‘post Macondo’ industry</td>
</tr>
<tr>
<td>Risk Management</td>
<td>Drilling operations involve risk. However, a well managed operation mitigates against these risks such that they do not negatively impact the ongoing work. This module explores the process of identifying, assessing and managing those risks.</td>
<td>• Understand hazards and the three main types of risk in oil and gas operations&lt;br&gt;• Learn how risks are identified, classified and assessed using the formal Risk Assessment process&lt;br&gt;• Learn about the tools used to mitigate against risks</td>
</tr>
<tr>
<td>Management of Change</td>
<td>Managing change is critical to successful operations. In this module learners will be introduced to the common types of risk and the process of change management in oil and gas.</td>
<td>• Understand how risk and change is assessed&lt;br&gt;• Learn how to understand, define and document a change</td>
</tr>
<tr>
<td>Well Examination and Verification</td>
<td>Well examination and verification are critical tools used to ensure safe and competent well design and operations. This module provides an introduction to the examination and verification process.</td>
<td>• Understand the well examination and verification process</td>
</tr>
<tr>
<td>Project Close-out</td>
<td>This module will explore the activities commonly undertaken once a drilling operation has been completed in order to close-out the project.</td>
<td>• Understand common project close-out protocol&lt;br&gt;• Understand the details of physical, administrative and contractual project close-out processes</td>
</tr>
<tr>
<td>Well Integrity Management</td>
<td>This module will provide students with an understanding of the key elements of well integrity, why well integrity is important and the techniques used to ensure wells remain safe throughout their life cycle.</td>
<td>• Understand what well integrity is&lt;br&gt;• Become familiar with well integrity concepts&lt;br&gt;• Understand the importance of well integrity throughout the lifecycle of a well</td>
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Specialised Applications

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<tr>
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<tbody>
<tr>
<td>Unconventional Gas</td>
<td>Natural gas will play a large role in our energy future. In this module we explore the role of unconventional gas reserves in this landscape and how technology and design are being used to mitigate against environmental impacts.</td>
<td>• The role of unconventional gas&lt;br&gt;• Technology and design Shale gas&lt;br&gt;• Coal-bed methane</td>
</tr>
<tr>
<td>Unconventional Oil</td>
<td>In this module learners will explore the different types of unconventional oil, the technology solutions and both the design and environmental challenges faced.</td>
<td>• The role of unconventional oil&lt;br&gt;• Technology and design Shale oil&lt;br&gt;• Oil sands&lt;br&gt;• Heavy oil&lt;br&gt;• Gas to liquids</td>
</tr>
<tr>
<td>Arctic Drilling</td>
<td>With significant reserves of oil and gas held beneath Arctic waters it is hard to ignore the potential of the region. However unique design, technology and environmental challenges must be overcome. This module will provide learners with a core understanding of the main issues facing Arctic operations.</td>
<td>• Drilling in the Arctic&lt;br&gt;• Technical and design challenges&lt;br&gt;• Oil and gas transportation challenges&lt;br&gt;• CSR and the environment</td>
</tr>
<tr>
<td>Deepwater</td>
<td>Deepwater operations are some of the most challenging in our industry. This module provides an understanding of the key concepts, technology, challenges and operations of deepwater projects worldwide.</td>
<td>• Why deepwater is needed&lt;br&gt;• Deepwater technology and equipment&lt;br&gt;• Deepwater well design and operations</td>
</tr>
<tr>
<td>Extended Reach Drilling</td>
<td>Extended reach drilling methods are being increasingly used to access remote reservoirs and maximise productivity. In this module we will discover the design and operational challenges faced when carrying out these projects.</td>
<td>• The need for Extended Reach&lt;br&gt;• Design challenges&lt;br&gt;• Technology and equipment ERD Operations</td>
</tr>
<tr>
<td>HPHT</td>
<td>HPHT wells are some of the most challenging ever drilled. In this module learners will explore the unique nature of HPHT wells, what makes a well HPHT and that affects well design and operations.</td>
<td>• How HPHT wells differ from conventional wells&lt;br&gt;• HPHT well design and equipment selection&lt;br&gt;• HPHT drilling procedures</td>
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## Advanced Well Control

### Course Names and Descriptions

<table>
<thead>
<tr>
<th>Course Name</th>
<th>Course Description</th>
<th>Learning Focus</th>
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</table>
| **Cause and Prevention of Kicks** | Understanding the causes of kicks, and the main preventative methods of conducting drilling and tripping operations, is essential to good well control practice. From this advanced module learners will be able to demonstrate a detailed knowledge of the primary mechanisms that result in loss of primary well control, and the methods used to prevent kicks occurring during drilling and tripping operations. | • Causes of kicks  
• Prevention of kicks while tripping  
• Prevention of kicks while drilling |
| **Kick Detection** | Knowing what to look for, and how to interpret well behaviour, is key in ensuring a rapid response to well control incidents. In completing this module learners will be able to explain the primary kick detection methods, including how they are employed and how results are interpreted. | • Kick warning signs  
• Drilling breaks  
• Torque and drag  
• Cuttings analysis  
• Shale density  
• Oil based mud  
• Flow checks |
| **Shut-in Methods** | How to shut the well in, and how shut-in methods can vary between scenarios, is a key element of advanced well control understanding. From this module learners will gain a detailed knowledge of well shut-in principles, and be able to explain the differences in shut-in procedures used in common scenarios. | • Shut-in philosophy  
• Land rigs  
• Jack-up rigs  
• Floating rigs  
• Kicks while running casing  
• Kicks while out of the hole |
| **Well Control Methods** | Understanding the advantages, disadvantages and implications of the range of well control methods is essential in ensuring a robust response to well control incidents. In this advanced module learners will gain an understanding of the different well kill methods, when they should be selected and what sets them apart. | • Kill method selection  
• Circulation kill methods  
• Volumetric method  
• Combined stripping and volumetric method  
• Bullheading |
| **Well Control Equipment** | The selection, operation, testing and inspection of well control equipment is an essential part of assuring well integrity. In completing this module learners will gain a wide understanding of the various components of industry well control systems, including the recommendation of BOP configurations and equipment test requirements. | • Ram BOPs  
• Annular BOPs  
• Diversers  
• Wellheads  
• Manifolds  
• Subsea  
• Testing and Inspection |
| **Deepwater** | Deepwater operations present unique risks in relation to well control. As an increasing number of Operators turn to deepwater prospects, the ability to understand, mitigate and respond to deepwater well control incidents grows. From this advanced module learners will be able to demonstrate an understanding of the main features unique to deepwater well control. | • Fracture gradient  
• Choke line fluid displacement  
• Subsea BOP Systems  
• BOP Control Systems  
• Subsea accumulator volume  
• Deepwater Well Control Procedures |
| **Common Problems** | The ability to react to changing situations is just as important as the ability to plan, design and prevent well control incidents taking place. By completing this module learners will gain an understanding of the common problems encountered during well control incidents, including how to avoid, diagnose and overcome them. | • Stripping  
• Zero pressure drillpipe  
• Subsea wells  
• Equipment limitations  
• Power failure  
• Plugged choke  
• Stopping the circulation  
• Underground blowouts  
• Highly deviated wells  
• Horizontal wells  
• Oil base mud  
• Gas hydrates  
• Stack gas clearing procedure  
• Loss of secondary well control |
| **Tertiary Control** | A thorough understanding of tertiary control is essential in assuring well control competency. Often overlooked, the last line of defence is critical in the protection of life, assets and the environment during well control incidents. In this module learners will explore the various tertiary well control methods and how these are employed. | • Capping stacks  
• Relief well drilling  
• Bantine plugs  
• Cement plugs |

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**Course Name** | **Course Description** | **Learning Focus**
---|---|---
**Kick Tolerance** | How to calculate and monitor kick tolerance is a key element of well control assurance. In completing this module learners will gain an in-depth understanding of how to calculate kick tolerance and make recommendations based on those results. | • Kick tolerance calculation  
• Kick tolerance while drilling  
• Kick tolerance limits |

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**Cause and Prevention of Kicks**

- Understanding the causes of kicks, and the main preventative methods of conducting drilling and tripping operations, is essential to good well control practice. From this advanced module learners will be able to demonstrate a detailed knowledge of the primary mechanisms that result in loss of primary well control, and the methods used to prevent kicks occurring during drilling and tripping operations.

- **Learning Focus**
  - Causes of kicks
  - Prevention of kicks while tripping
  - Prevention of kicks while drilling

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**Kick Detection**

- Knowing what to look for, and how to interpret well behaviour, is key in ensuring a rapid response to well control incidents. In completing this module learners will be able to explain the primary kick detection methods, including how they are employed and how results are interpreted.

- **Learning Focus**
  - Kick warning signs
  - Drilling breaks
  - Torque and drag
  - Cuttings analysis
  - Shale density
  - Oil based mud
  - Flow checks

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**Shut-in Methods**

- How to shut the well in, and how shut-in methods can vary between scenarios, is a key element of advanced well control understanding. From this module learners will gain a detailed knowledge of well shut-in principles, and be able to explain the differences in shut-in procedures used in common scenarios.

- **Learning Focus**
  - Shut-in philosophy
  - Land rigs
  - Jack-up rigs
  - Floating rigs
  - Kicks while running casing
  - Kicks while out of the hole

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**Well Control Methods**

- Understanding the advantages, disadvantages and implications of the range of well control methods is essential in ensuring a robust response to well control incidents. In this advanced module learners will gain an understanding of the different well kill methods, when they should be selected and what sets them apart.

- **Learning Focus**
  - Kill method selection
  - Circulation kill methods
  - Volumetric method
  - Combined stripping and volumetric method
  - Bullheading

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**Well Control Equipment**

- The selection, operation, testing and inspection of well control equipment is an essential part of assuring well integrity. In completing this module learners will gain a wide understanding of the various components of industry well control systems, including the recommendation of BOP configurations and equipment test requirements.

- **Learning Focus**
  - Ram BOPs
  - Annular BOPs
  - Diversers
  - Wellheads
  - Manifolds
  - Subsea
  - Testing and Inspection

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**Deepwater**

- Deepwater operations present unique risks in relation to well control. As an increasing number of Operators turn to deepwater prospects, the ability to understand, mitigate and respond to deepwater well control incidents grows. From this advanced module learners will be able to demonstrate an understanding of the main features unique to deepwater well control.

- **Learning Focus**
  - Fracture gradient
  - Choke line fluid displacement
  - Subsea BOP Systems
  - BOP Control Systems
  - Subsea accumulator volume
  - Deepwater Well Control Procedures

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**Common Problems**

- The ability to react to changing situations is just as important as the ability to plan, design and prevent well control incidents taking place. By completing this module learners will gain an understanding of the common problems encountered during well control incidents, including how to avoid, diagnose and overcome them.

- **Learning Focus**
  - Stripping
  - Zero pressure drillpipe
  - Subsea wells
  - Equipment limitations
  - Power failure
  - Plugged choke
  - Stopping the circulation
  - Underground blowouts
  - Highly deviated wells
  - Horizontal wells
  - Oil base mud
  - Gas hydrates
  - Stack gas clearing procedure
  - Loss of secondary well control

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**Tertiary Control**

- A thorough understanding of tertiary control is essential in assuring well control competency. Often overlooked, the last line of defence is critical in the protection of life, assets and the environment during well control incidents. In this module learners will explore the various tertiary well control methods and how these are employed.

- **Learning Focus**
  - Capping stacks
  - Relief well drilling
  - Bantine plugs
  - Cement plugs

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