Duration/Dates of Course
4 - 5 days (Classroom format)

Overview
This introductory course outlines the delivery of complex deepwater drilling projects. It further explores why project management and a multidisciplinary approach is essential to a project’s success. The course enables participants to develop the knowledge and skills to design, engineer and apply a practical approach to a deepwater project’s drilling operations success.

Target Participants
Persons engaged in deep-water or complex well’s drilling projects; e.g., in well design, engineering, operational or organizational functions such as admin, technical, finance, QHSE, logistics, services, support, drilling, geology, geo-science, petroleum, reservoir, completions, workover, and production. Pre-requisite: 2-3 years basic to intermediate knowledge of offshore drilling.

Purpose
• A practical and participative course that shall enable a multidisciplinary project team to develop the skills and knowledge to design, engineer and safely drill a deepwater well.

Goals and Objectives
• Deliver the awareness required for a multidisciplinary team’s skills-set to be developed to enable the practical design, engineering and safe drilling operation of a deepwater well.
• Develop the knowledge required to recognize and analyze the difficulties, challenges and opportunities that exist in deepwater drilling, design, execution and how to mitigate operations risks to as low as reasonably practicable.
• Equip participants with the required tools to evaluate, organize, plan, implement and control a deepwater well’s drilling operating process from the project start to its end.

Course Take Away
• Know the drilling differences between normal offshore and deepwater wells.
• Develop a wider skill to deliver a deepwater well’s safe drilling and operational requirements.
• Enabled to label and identify key project hazards and risks presented within deepwater drilling, and have the knowledge to practice, control and mitigate the operating conditions and contingencies required.
• Develop the knowledge to adapt the technologies best suited for deepwater drilling operations.
# Course Summary
## Well Design, Engineering & Operations

<table>
<thead>
<tr>
<th>Session</th>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
<th>Day 5</th>
</tr>
</thead>
</table>
| 08:30 to 10:15 | **Introduction**  
  Goals and Objectives  
  Deepwater drilling differences  
  Self-test quiz | **DW** * Shallow* Structural design  
  Case studies, worked examples | **DW** casing and engineering design  
  Case studies, worked examples | **DW** well integrity, control and operational management  
  Case studies | **DW** adaptive technology opportunities  
  Media files, Case studies, worked examples |
| 10:30 to 12:00 | DW projects  
  Standards, regulations, and guidelines | DW Riserless drilling  
  Case studies, worked examples | Wellbore pressure and stability management  
  Case studies, worked examples | Secondary control, contingency and emergency response  
  Case studies, worked examples | Suspension and abandonment of wells  
  Case studies, worked examples  
  Post quiz (30mins) |
| 12:00 to 13:00 | **Lunch Break** | | | | |
| 13:00 to 14:30 | DW rigs, equipment, systems  
  Media files | DW water subsea capital equipment  
  Media files | Dw drilling and cementing fluids | Learning from Macondo (45mins video)  
  Lessons learned discussion | Parking lot questions, course debrief, feedback and closeout |
| 14:45 to 16:30 | DW Geology, Geoscience hazards and challenges | Conductor, wellhead, BOP riser design  
  Case studies, worked examples | DW problems, hazards, risk and change management  
  Group exercise | DW well control problems  
  Close-out  
  Group exercise | |

* *DW* = Deepwater
# Course Details

## Well Design, Engineering & Operations

### Day 1

**Deepwater Fundamentals, Essentials**

**DW Essentials and differences:**
- Definitions, environments
- Delivering deepwater projects
- Well design, engineering and operations
  
  *Media files 'Deepwater drilling'*

**DW Project Standards, Rules, Regulations:**
- Deepwater trends and drivers
- Project management essentials
- Control and metric principles

**DW Rigs, equipment, systems:**
- Rigs, equipment challenges and selection
- Pipe handling systems, station keeping
- Riser compensation, tensioning systems
- Subsea BOP and auxiliary equipment
- Marine systems, supply and logistics chain
  
  *Media files supplement in this session*

**DW Geology and geoscience:**
- Deepwater geoscience environments
- Deepwater geoscience hazards
- Pressure, stability, wellbore management
  
  *Media files supplement in this session*

**Debrief:** Review of Day 1

### Day 2

**DW Design, SSBOP, Riser and Subsea Equipment**

**Deepwater structural string design:**
- Structural string design
- Wellhead and structural string guidelines
- Worked examples and case studies

**Deepwater Riserless Drilling:**
- Riserless convention and non-convention
- Shallow hazard prediction and mitigation
- Deepwater riserless drilling, with worked examples and case studies
  
  *Media files supplement in this session*

**DW Subsea Capital Equipment:**
- Diverters and marine risers
- Riser and associated components
- BOP and wellhead integrated design
  
  *Media files supplement in this session*

**DW Conductor, Wellhead, SSBOP/Riser design:**
- Drilling riser and wellhead equipment
- Riser behavior, Operating criteria
- Riser analysis, Case study examples

**Debrief:** Review of Day 2
Course Details
Well Design, Engineering & Operations

Day 3

Deepwater Well Construction, Management

Deepwater casing, tubular design, well integrity
- Deepwater casing design
- Annular pressure build up and wellhead growth
  Worked examples
- Well integrity failure prevention and mitigation
  Case studies

Deepwater Pressure and Stability Management:
- Pressure prediction and detection
- Pressure Management in deepwater
- Wellbore stability management
  Media files supplement in this session

Deepwater Drilling & Cementing:
- Deepwater drilling fluids
  - Water based, oil based
  - Challenges
  - Solutions and application
- Deepwater cementing:
  - Challenges
  - Cementing technologies
  - Solutions and application
  Media files supplement in this session

Deepwater Situational Problems Hazards, Risks:
- Labelling deepwater drilling problems
- Problem solving, risk management and decision making. Case studies, examples
- Contingency and response management

Debrief: Review of Day 3

Day 4 | 5

DW Well Integrity, Control, Assurance

Well control ‘level 1’ assurance management:
- Primary ‘level 1 Deepwater well control’
- Standard operating procedures.
- Best practices, Competency training

Deepwater Secondary ‘level 2’ well control:
- ‘Level 2’ Deepwater well control
- Non-standard operating procedures
- Best practices, Competency training

Deepwater ‘level 3’ well control:
- Learning from DW well control failures
  Macondo investigative media file
- ‘Level 3’ Emergency contingency response

Deepwater Well Control Group exercise:
- Deepwater level 1, 2 & 3 case studies, individual and
  work group exercises

Debrief: Review of Day 4

Day 5: Deepwater Technology, Well Abandonment

Deepwater Adaptive technologies:
- What technologies are for DW?
- Review of adaptive DW technologies
- Technology applications.
- What’s the future for deepwater?

Deepwater Well Abandonment:
- Well integrity assurance in suspension and
  abandonment
- Suspending deep-water wells
- Temporary abandonment
- Permanent abandonment
- Case study examples

Debrief: Review of Day 5

Final course review and feedback