# HSE in Drilling Operations

## Overview

**LEVEL**
Knowledge

**PURPOSE**
This course provides a thorough understanding of risks associated to drilling operations and to reinforce the HSE culture of the workplace environment.

**LEARNING OBJECTIVES**
Upon completion of the course, participants will be able to:
- ensure high HSE standard during drilling operations,
- identify specific hazards, their associated risks during drilling operations and to define prevention and mitigation measures to reduce risks,
- identify the certificates necessary to ensure the suitability of equipment and personnel,
- understand and apply typical HSE management practices on site (prevention, protection, emergency planning).

**WAYS AND MEANS**
Several applications and illustrations.
Several case studies and teamwork sessions.

**LEARNING ASSESSMENT**
Quiz.

**PREREQUISITES**
No prerequisites for this course.

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## Agenda

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<tr>
<th><strong>GENERAL RISKS ASSOCIATED TO DRILLING OPERATIONS</strong></th>
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<tbody>
<tr>
<td>Risk of flammability:</td>
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<td>Explosive atmospheres (ATEX): flammable products, explosive limits and flash point.</td>
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<td>Ignition sources: naked flame, auto-ignition temperature, sparks and static electricity…</td>
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<td>Risks associated with chemical products/toxic gas (H₂S).</td>
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<td>Health and hygiene risks. Medical fitness to work certificates.</td>
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<td>Electrical Risks. Area classification requirements. Certificates.</td>
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<td>Personal Protective Equipment (PPE).</td>
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<tr>
<th><strong>RISKS ASSOCIATED WITH RIG EQUIPMENT</strong></th>
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<td>Introduction to risks associated to derrick, rig floor, stabbing board, derrick board and crown block.</td>
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<td>Certificates.</td>
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<td>Risk of dropped objects.</td>
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<td>Works at height.</td>
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Introduction to risks associated to drawworks, top drive, travelling block, winches and pipe handling system.
HSE management of lifting and rigging operations.

RISKS ASSOCIATED WITH DRILLING FLUIDS PROCESSING & CEMENTING OPERATIONS
Risks associated to mud preparation, mud tanks and mud pumps.
Confined space entry procedure.
Risks associated to cuttings treatment units: shakers, degasser, desander, centrifuge…
Risks associated to cementing units and cementing operations.
HSE management of pressurized equipment.

HSE MANAGEMENT OF WELL CONTROL EQUIPMENT
Scenarios associated to well control and main impacts. Examples of catastrophic events.
Description and action of well control equipment.
Testing requirements: functional and pressure tests.
Inspection and certification of equipment and personnel with responsibilities in well control scenarios.

RISKS ASSOCIATED WITH SUPPORT FACILITIES
Engine rooms, power generation and air compressors.
Risks at workshops: hand tools, compressed gas bottles.
HSE management of storage areas.
Introduction to HSE in logistics: materials and personnel transportation requirements.

SAFETY ENGINEERING APPLIED TO DRILLING OPERATIONS
General layout of drilling activities: safety distances.
Fire & gas detection systems: certificate and testing requirements.

RISKS IN WELL INTERVENTION OPERATIONS
Introduction to common well intervention equipment. Main risks.
Well control equipment in well intervention.
Risks in perforation and well abandonment.

ORGANISATIONAL FRAMEWORK
Introduction to HSE management system.
HSE management of contractors:
HSE evaluation of contractor selection.
Objectives and development of HSE Bridging Document: case study.
Emergency response planning:
Main elements and resources: blow out contingency plan, environmental contingency plan and medevac plan.
Clinic requirements.
Risks associated to simultaneous operations with production and construction activities.
Management of change procedure.
Undesired event reporting.

ENVIRONMENTAL MANAGEMENT OF DRILLING OPERATIONS
Introduction to environmental impacts of drilling operations.
Environmental impact assessment and environmental management plan.
Waste management practices for drilling operations.
Well testing environmental impacts.