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.

**Agenda**

**GENERAL RISKS ASSOCIATED TO DRILLING OPERATIONS**
0.75 d
Risk of flammability:
- Explosive atmospheres (ATEX): flammable products, explosive limits and flash point.
- Ignition sources: naked flame, auto-ignition temperature, sparks and static electricity…
- Risks associated with chemical products/toxic gas (H₂S).
- Health and hygiene risks. Medical fitness to work certificates.
- Electrical Risks. Area classification requirements. Certificates.
- Personal Protective Equipment (PPE).

**RISKS ASSOCIATED WITH RIG EQUIPMENT**
1 d
Introduction to risks associated to derrick, rig floor, stabbing board, derrick board and crown block.
- Certificates.
- Risk of dropped objects.
- Works at height.
Introduction to risks associated to drawworks, top drive, travelling block, winches and pipe handling system. Certificates.
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.