ICTD
المركز العالمي للتدريب والتطوير
International Centre For Training & Development

HSE116
Offshore Reliability, HAZOP, Risk and Safety

Course Introduction:

Risk has become a key concept in modern society. Growing concern about the environment and a number of disasters have served to focus attention on the hazards and risks involved in a wide range of activities from offshore oil production to rail and air transport; from the design of football stadia to the operation of chemical plants and environmental protection. Today there is a wide range of techniques available to assess risk and reliability, both in relation to safety and in the wider sense. These techniques now underpin new legislation on safety and have relevance over a broad spectrum of activities, including environmental and other systems, where risk and reliability are key concerns.

Course Objectives:

Upon successful completion of this course, the delegates will be able to:

- Acquire a basic knowledge of the concept of risk and its application in the offshore industry
- Carryout reliability analysis techniques and the mathematical basis of risk and reliability
- Apply reliability block diagrams, fault tree and event trees analysis to the assessment of an underwater system
- Identify the role of human error and equipment failure in accident causation

Who Should Attend?

This course is intended for managers, engineers and individuals involved in planning, managing and/or handling emergencies, safety, risk and reliability in offshore sites or facilities.

Course Outline:

Day 1:

Pre-Test

Introduction:

- Concept of Risk
- ALARP Criteria
- Reliability Engineering

FMECA and HAZOPS:

- Failure modes and Effects Analysis
- System and Component Failure
- Qualitative Risk Matrices
- Hazard and Operability Studies

Reliability Data:

- Types
- Data Collection Methods & Data Sources
- Typical Failure Rate Data
- Weibull Analysis
- Data Plots

Day 2:

Human Reliability Analysis and Accident Causation:

- Major Accident Sequences
- Risk Perception and Control Of Risk
- Human Reliability Analysis Techniques
- HEART and THERP

Offshore Safety Case and Formal Safety Assessments:

- Regulatory Regime
- Safety Case Requirements
- Types of Study
- Scenario Development
- QRA Methods
- Consequence Analysis
- Vulnerability of Essential Systems
- Smoke and Gas Ingress
- Evacuation Escape and Rescue and Typical Output

Pipeline Corrosion Risk Analysis:

- Corrosion of Steel Pipelines Offshore
- Stress Strength Interference for Estimation of Safe Life and Probability of Failure

Day 3:

Statistics and Probability Distributions:

- Basic Boolean Algebra

- Bayes Theorem and commonly Used Discrete and Continuous Probability Distributions

Systems' Reliability Techniques:

- Reliability Block Diagrams and Networks
- Estimation of Cut Sets and Tie Sets

Day 4:

Availability Modelling:

- System Availability and Impact of Maintenance Strategy
- Component Reliability
- Markov State Space Models
- Use of Availability Simulators

Review of Major Accidents Offshore:

- Sea Gem
- Alexander Keilland,
- Star Canopus
- Piper Alpha Disasters

Day 5:

Diving Bell Risk Analysis Workshop:

- RBD, FTA, and ETA
- FMECA Approach to Assessment

Introduction to Structural Reliability Analysis:

- Stress Strength Interference and Limit State Concepts
- FORM and SORM
- Damage Accumulation and Modelling of Time Dependent Failures

Post Test

Course Certificate:

International Center for Training & Development (ICTD) will award an internationally recognized certificate(s) for each delegate on completion of training.

Course Methodology:

A variety of methodologies will be used during the course that includes:

- (30%) Based on Case Studies
- (30%) Techniques
- (30%) Role Play
- (10%) Concepts
- Pre-test and Post-test
- Variety of Learning Methods
- Lectures
- Case Studies and Self Questionaires
- Group Work
- Discussion
- Presentation

Course Fees:

To be advised as per the course location. This rate includes participant's manual, and-Outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Course Timings:

Daily Course Timings:

08:00 - 08:20	Morning Coffee / Tea
08:20 - 10:00	First Session
10:00 - 10:20	Coffee / Tea / Snacks
10:20 - 12:20	Second Session
12:20 - 13:30	Lunch Break & Prayer Break
13:30 - 15:00	Last Session