

# NATURALLY OCCURRING RADIOACTIVE MATERIAL - LEVEL 1

## HSE036

### COURSE DESCRIPTION

General workers will all need induction training to ensure that they are capable of recognizing and understanding warning signs, signals and barriers. All workers need to comply with radiation safety instructions given by qualified workers and Radiation Protection Officers (RPOs). Workers who are partially involved with radiation, for example individuals working with gauges (in which the source remains within the protective housing), industrial radiography assistants and maintenance personnel, need further radiation safety training commensurate with the degree of their involvement. The level of training needed will depend on the specific application. However, supervision by the qualified worker or by the RPO is always necessary. The radiation safety training provided for workers will be affected by means of briefings, demonstrations and practical exercises. This course has been designed according to these requirements.

### COURSE GOAL

To enhance participants' knowledge, skills, and abilities necessary to ensure that they can recognize and understand warning signs, signals and barriers and to comply with radiation safety instructions.

### COURSE OBJECTIVES

By the end of this course, participant will be able to:

- Understand radiation protection principles.
- Understand and apply basic concepts of occupational radiation protection.
- Determine sealed radiation sources and radiation generators in the oil and gas industry.
- Use personal protective equipment.
- Understand norm in the oil and gas industry.
- Understand how to monitor radiation in the workplace.
- Help in emergencies and contingency planning.

### WHO SHOULD ATTEND

- Junior staff working in oil and gas industry
- Workers who are partially involved with radiation
- Industrial radiography assistants and maintenance personnel

### COURSE DURATION

5 Working Days

## COURSE OUTLINES

### 1. Radiation Protection Principles

- Relevant Quantities and Units
  - Absorbed Dose
  - Radiation Weighting Factors and Equivalent Dose
  - Tissue Weighting Factors and Effective Dose
  - Committed Equivalent Dose and Committed Effective Dose
  - Operational Quantities
- Normal Levels of Exposure
  - Natural Background Radiation
  - Artificial Sources of Radiation

### 2. Basic Concepts of Occupational Radiation Protection

- Occupational Exposure
- Control of Exposure to External Radiation
- Control of The Contamination Hazard
  - Containment
  - External and Internal Personal Contamination
  - Protective Clothing
  - Fixed and Removable Contamination
- Controlled Areas
- Radiation Protection Programmes
- Application of Annual Limits

### 3. Sealed Radiation Sources and Radiation Generators in the Oil and Gas Industry

- Practices Involving Sealed Sources and Radiation Generators
  - Industrial Radiography
  - Installed Gauges
  - Mobile Gauging Equipment and Articles
  - Well Logging
- Safety of Sealed Sources
  - Radiation Safety During Normal Working Conditions

### 4. Special Focus Topic: Personal Protective Equipment

- General Considerations
  - Control of Exposure

- Types of Personal Protective Equipment
- Selection of Personal Protective Equipment

## 5. Special Focus Topic: Personal Protective Equipment

- Protective Suits: Choosing a Protective Suit
- Gloves: Procedure for Removing Contaminated Gloves
- Footwear: Barrier Procedures for Protective Footwear

## 6. Norm in the Oil and Gas Industry

- General Aspects of Norm Origin and Types of Norm in the Oil and Gas Industry
  - Mobilization from Reservoir Rock and Deposition
  - Main Forms of Appearance
  - Radionuclide Concentrations
- Radiation Protection Aspects of Norm
  - External Exposure
  - Internal Exposure
  - Practical Radiation Protection Measures

## 7. Radiation Monitoring in the Workplace

- Measurement Principles and Instruments
  - Principles
  - Dose Rate Meters
  - Dosimeters
  - Surface Contamination Monitors
  - Contamination Monitors for Airborne Radioactivity

## 8. Emergencies and Contingency Planning

- Accidents Involving Sealed Sources
  - High Exposure and Overexposure to Radiation Sources
  - Lost or Misplaced Sources
  - Retrieval of Disconnected Sources from a Well
- Emergencies Resulting from Accidents with Unsealed Sources
  - External Overexposures
  - Internal Overexposures
  - Spills
  - Lost Material

