

## Advanced Risk Assessment & Control for Occupational Health Hazards

### Course general description:

This advanced course provides an in-depth understanding of **occupational health hazard identification, risk assessment, and control measures**. It covers **qualitative and quantitative risk assessment techniques**, including exposure assessment, toxicology principles, and industrial hygiene controls. Participants will learn how to conduct effective risk assessments and implement control strategies to protect workers from chemical, physical, biological, and ergonomic hazards

### Audience:

This course is intended for professionals working in risk management, process safety, operations, and safety leadership roles, including:

- Occupational Health & Safety (OHS) Professionals
- Industrial Hygienists
- Risk Managers
- Health & Safety Auditors
- Environmental, Health & Safety (EHS) Managers
- Process Safety Engineers
- Occupational Medicine Practitioners
- Regulatory Compliance Officers

### Course objectives:

By the end of this course, participants will:

- Gain comprehensive knowledge of **OSHA 1910.119** and **CCPS PSM** standards and how they apply to high-risk industries.
- Understand **PSM compliance requirements** and best practices for preventing catastrophic accidents.
- Learn how to develop, implement, and sustain an effective **PSM program** in alignment with regulatory requirements and industry best practices.
- Conduct **hazard analyses** (e.g., HAZOP, What-If, LOPA) and develop **risk management** strategies.
- Build a **PSM culture** within an organization by addressing leadership, communication, and training needs.
- Learn about the **Management of Change (MOC)** process, **incident investigation**, and **emergency planning**.
- Use case studies to understand common **compliance failures** and learn how to address them.
- Develop strategies for **continuous improvement** in PSM compliance and overall safety performance.

### Course duration:

5 days

### Course location:

Dubai

### Course contents:

#### **Day 1: Fundamentals of Occupational Health Hazards & Risk Assessment Frameworks**

- Pretest
- **Introduction to Occupational Health & Safety Risk Assessment**

- Definitions: **Hazard, Risk, Risk Perception & Acceptability**
- Legal and regulatory overview: **OSHA, ACGIH, ISO 45001, NIOSH, and WHO guidelines**
- **Key risk assessment frameworks** (ISO 31000, ISO 45001, OSHA 1910)
- Case studies of major occupational health incidents
- **Types of Occupational Health Hazards**
  - **Chemical Hazards:** Toxic substances, heavy metals, solvents
  - **Physical Hazards:** Noise, vibration, radiation, extreme temperatures
  - **Biological Hazards:** Pathogens, allergens, bioaerosols
  - **Ergonomic Hazards:** Repetitive motion, manual handling, workstation design
  - **Psychosocial Hazards:** Workplace stress, shift work, mental health risks
- **Introduction to Risk Assessment Methodologies**
  - **Qualitative vs. Quantitative Risk Assessment**
  - **HAZOP, FMEA, Bowtie Analysis, and Fault Tree Analysis (FTA)**
  - **Occupational Health Risk Assessment Matrix (OHRA)**

#### Day 2: Exposure Assessment & Toxicology Principles

- **Chemical Exposure & Risk Analysis**
  - **Toxicology Basics:** Dose-response relationship, routes of exposure, metabolism
  - **Occupational Exposure Limits (OELs, TLVs, PELs, RELs, IDLH)**
  - **Inhalation vs. dermal vs. ingestion exposure risks**
- **Occupational Exposure Monitoring Techniques**
  - Air sampling and real-time monitoring (Personal vs. area sampling)
  - Biological monitoring (biomarkers for lead, benzene, and silica)
  - Workplace hazard mapping and predictive exposure modeling
- **Evaluating Chronic vs. Acute Exposures**
  - Long-term occupational diseases (asbestosis, silicosis, cancer)
  - Short-term exposure risks and emergency response
- **Practical Exercise:** Conducting an exposure monitoring assessment using a case study

#### Day 3: Physical, Biological & Ergonomic Risk Assessments

- **Assessing Physical Hazards in the Workplace**
  - Noise exposure monitoring & control (ISO 1999, OSHA 1910.95)
  - Vibration analysis (ISO 5349 for hand-arm vibration)
  - Thermal stress and radiation safety (ISO 7243, NFPA 70E for arc flash)
- **Biological Hazard Risk Assessment & Controls**
  - Zoonotic and infectious disease transmission risks
  - Workplace biohazard monitoring techniques
  - OSHA Bloodborne Pathogens Standard (29 CFR 1910.1030)
- **Ergonomic Risk Assessment & Control Strategies**
  - Human factors in risk management (ISO 6385 Ergonomics Principles)
  - Repetitive Strain Injury (RSI) and musculoskeletal disorder (MSD) prevention
- **Practical Exercise:** Conducting an ergonomic risk assessment of a workstation

#### Day 4: Risk Control Strategies & Mitigation Measures

- **Applying the Hierarchy of Controls in Occupational Health**
  - **Elimination & Substitution:** Safer chemical alternatives
  - **Engineering Controls:** Local exhaust ventilation (LEV), isolation techniques
  - **Administrative Controls:** Job rotation, shift work management, training
  - **Personal Protective Equipment (PPE) Standards & Limitations**
- **Developing Health Surveillance & Medical Monitoring Programs**
  - Worker health screening & long-term exposure tracking
  - Respiratory protection programs (OSHA 1910.134)
  - Post-exposure protocols & occupational disease reporting
- **Emergency Preparedness for Occupational Health Incidents**
  - Crisis management for hazardous substance exposures
  - Decontamination protocols & first aid measures
  - Psychological first aid and mental health crisis management
- **Practical Exercise:** Developing a risk control strategy for a given workplace scenario
- **Day 5: Occupational Risk Communication & Continuous Improvement**
  - **Risk Perception & Communication Strategies**
  - **Behavioral safety and human error in risk management**
  - Engaging employees in occupational health initiatives
  - **Effective safety training methodologies** (adult learning principles)
- **Occupational Health Risk Assessment in ISO & OSHA Frameworks**
  - Aligning occupational health assessments with **ISO 45001 & ISO 31000**
  - OSHA's Injury and Illness Prevention Program (IIPP) implementation
  - Continuous improvement techniques (Plan-Do-Check-Act, Kaizen in OHS)
- **Course Wrap-Up & Final Assessment:**
  - Review of key takeaways, lessons learned, and action plan development
  - Final knowledge assessment & certification issuance
  - **Course Wrap-Up:** Review of Key Takeaways, Q&A, and Final Assessment

#### **Methodology:**

- 50% lectures & concepts
- 10% Videos
- 10% Case studies
- 10% Exercises
- 10% Discussions
- 10% Software (if applicable or examples)

#### **Assessment and Certification:**

Upon successful completion, participants will receive a **Certificate of Completion in Advanced Risk Assessment & Control for Occupational Health Hazards**, demonstrating their expertise in **occupational risk management, exposure assessment, and hazard control strategies.**

#### **Course code: (THSE005)**