CONCEPT

Laboratory Safety Management: Chemical Hygiene, Fume Hoods and Spill Response

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Introduction:

Laboratory safety management fails when chemicals are stored by alphabet, fume hoods go unchecked, gas cylinders stand unsecured and nobody has rehearsed a spill until one happens. Injuries, exposures and fires in laboratories usually trace back to these gaps rather than to rare events. This Core Concept course trains laboratory managers, safety officers and lab staff to assess laboratory hazards, run a chemical hygiene plan, apply GHS labels and safety data sheets, check fume hoods and manage gases, cryogens, equipment, waste and emergencies. Participants build a Laboratory Chemical Hygiene and Emergency Response Plan.

Course Objectives:

- Assess laboratory tasks for chemical, biological, physical and equipment hazards and select controls using the hierarchy of controls
- Write and maintain a chemical hygiene plan with standard operating procedures, prior approval rules and defined roles
- Apply GHS labels and safety data sheets to store and segregate chemicals by hazard class
- Check fume hood and biological safety cabinet performance and control compressed gases, cryogens and laboratory equipment hazards
- Organise laboratory waste segregation, spill response and emergency arrangements that staff can execute
- Inspect a laboratory against a scored checklist and plan the safety training that closes the gaps found

Target Audience:

- Laboratory supervisors responsible for daily safe operation of research, testing, clinical or teaching laboratories
- Safety officers and chemical hygiene officers responsible for laboratory inspections, procedures and incident follow-up
- Laboratory technicians and analysts responsible for handling chemicals, gases, cryogens and biological materials
- Facilities and technical services staff responsible for fume hoods, gas supplies, eyewash stations and safety showers
- Stores and waste coordinators responsible for chemical receipt, storage and laboratory waste collection

Course Outline:

Day 1: Laboratory Hazards and Risk Assessment

- Laboratory Hazard Categories: Chemical, Biological, Physical and Equipment Hazards
- Laboratory Task Risk Assessment Form and Hierarchy of Controls
- Chemical Inventory Register and Hazard Classification Review
- Roles of the Chemical Hygiene Officer, Laboratory Supervisors and Laboratory Users
- Laboratory Safety Baseline Audit Checklist

Day 2: Chemical Hygiene Plan, GHS Labelling and Chemical Storage

- Chemical Hygiene Plan Structure: Standard Operating Procedures and Prior Approval Rules
- GHS Pictograms, Signal Words, Hazard and Precautionary Statements on Container Labels
- Sixteen-Section Safety Data Sheet Reading for Task Planning
- Chemical Storage Compatibility Chart and Segregation by Hazard Class
- Flammable and Corrosive Storage Cabinets and Peroxide-Former Date Control

Day 3: Fume Hoods, Gases, Cryogens, Biosafety and Laboratory PPE

- Chemical Fume Hood Face Velocity Checks, Sash Height and Smoke Visualisation
- Compressed Gas Cylinder Restraint, Regulators and Toxic Gas Detection
- Cryogen Dewar Handling and Oxygen Depletion Monitoring
- Biological Safety Cabinet Classes and Biosafety Levels at Overview Using the WHO Laboratory Biosafety Manual, 4th Edition
- Laboratory PPE Selection Matrix: Glove Chemical Resistance, Eye and Face Protection and Lab Coats

Day 4: Equipment Hazards, Laboratory Waste, Spills and Emergencies

- Centrifuge and Autoclave Hazards: Rotor Care, Imbalance, Aerosols and Sterilisation Cycle Indicators
- Laser Classes and Controlled Laser Areas at Overview
- Laboratory Waste Streams: Chemical, Biohazardous and Sharps Segregation and Container Labelling
- Chemical Spill Kit Selection and Spill Response Procedure by Spill Size
- Eyewash and Safety Shower Checks, Fire, Exposure and Evacuation Arrangements

Day 5: Laboratory Inspection Walkthrough and Emergency Response Plan

- Laboratory Safety Inspection Walkthrough Using a Scored Checklist
- Incident Case Review: Fume Hood Failure and Cryogen Asphyxiation Scenarios
- Laboratory Safety Induction and Refresher Training Matrix
- Tabletop Drill: Chemical Spill and Worker Exposure in a Shared Teaching Laboratory
- Build and Peer Review: Laboratory Chemical Hygiene and Emergency Response Plan

Skills You Will Gain:

- Laboratory Hazard Assessment
- Chemical Hygiene Planning
- Hazard Communication with GHS
- Chemical Segregation and Storage
- Containment Device Checks
- Compressed Gas and Cryogen Safety
- Laboratory Spill Response
- Laboratory Safety Inspection

Why Attend This Course:

- Return with a Laboratory Chemical Hygiene and Emergency Response Plan written for your own laboratory
- Replace alphabetical shelving and unchecked hoods with storage and ventilation arrangements you can verify on a walkthrough
- Run a spill or exposure drill with confidence because the response steps have been rehearsed
- Compare laboratory practice with peers from industrial, university and hospital laboratories

Conclusion:

Safe laboratories rely on hazards that are assessed before work starts, chemicals that are labelled and segregated, containment devices that are checked and staff who know what to do when something spills. The course moves from hazard categories and risk assessment through the chemical hygiene plan, GHS and storage, then fume hoods, gases, cryogens, biosafety and PPE, and on to equipment, waste and emergencies. The final day applies a scored inspection walkthrough and produces a Laboratory Chemical Hygiene and Emergency Response Plan.