OSH 125 Introduction to Health Standards

- ***OSHA's Technical Manual***

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NCDOL N.C. Department of Labor
OSH Division
Internal Training

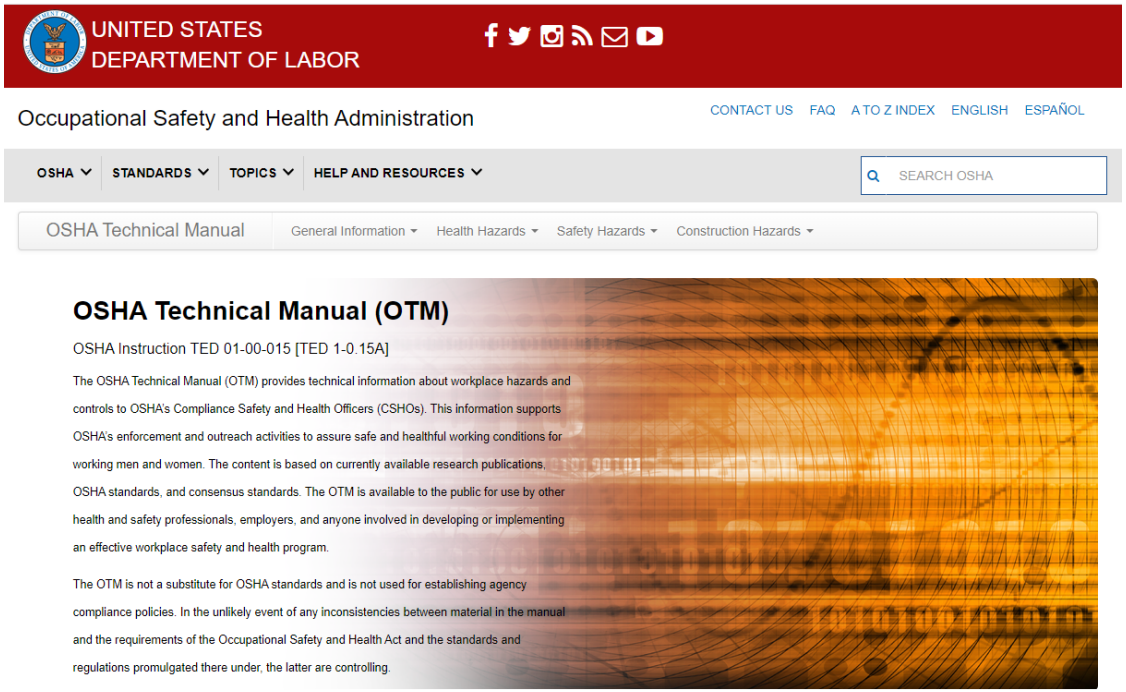
Objectives

In this course, we will look at:

- What is the OSHA Technical Manual
- The sections of the OSHA Technical Manual
  - More in-depth look at 6 of the 10 sections
- How to use the OSHA Technical Manual

OSHA Technical Manual (OTM)

- Content is based on currently available research publications, OSHA standards, and consensus standards



What is the purpose of the OTM?

- Provides technical information and guidance on occupational safety and health topics
- To assist OSHA Compliance Safety and Health Officers (CSHO's) in hazard recognition
- Provide guidance in accident prevention
- To serve as a source of advice for CSHO's on safety and health issues

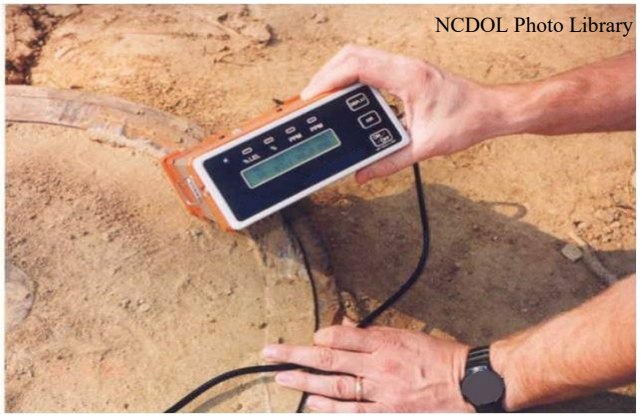
OTM is NOT …

- A substitute for OSHA standards
- Intended to be used for establishing Agency compliance policies

Note: If OTM conflicts with OSH Act and the standards and regulations, the latter are controlling.

Ten OTM Sections

- General Information
- Sampling and Measurement Methods
- Health Hazards
- Safety Hazards
- Construction Operations
- Health Care Facilities
- Ergonomics
- Personal Protective Equipment
- Safety and Health Management
- Miscellaneous Issues



Section II: Sampling, Measurement Methods and Instruments

- **Chapter 1**: Personal Sampling for Air Contaminants
- **Chapter 2**: Sampling for Surface Contamination
- **Chapter 3**: Technical Equipment
- **Chapter 4**: Sample Shipping and Handling

Section II: Chapter 1

- **Personal Sampling for Air Contaminants**
  - General Sampling Procedures
  - Sampling Media
  - Special Sampling Procedures
  - Sampling for Welding Fumes
  - Equipment Preparation and Calibration
  - Filter Weighing
  - Appendices

Appendices

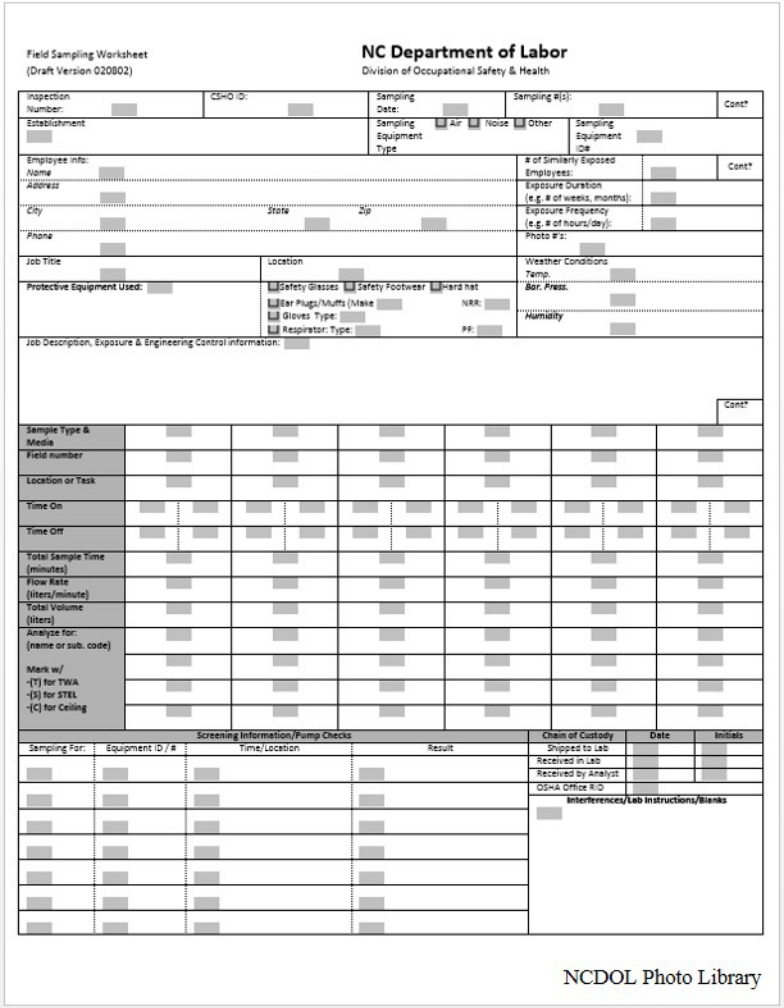
- Appendix II:1-1
  - **Detector Tubes and Pumps**
- Appendix II:1-2
  - **Electronic Flow Calibrators**
- Appendix II:1-3
  - **Manual Buret Bubble Meter Technique**
- Appendix II:1-4
  - **Shelf Life of Sampling Media Provided by SLTC**

Appendices (cont…)

- Appendix II:1-5
  - **Sampling for Special Analyses**
- Appendix II:1-6
  - **Sampling and Analytical Errors (SAE's)**
- Appendix II:1-7
  - **Partial List of Substances for Auto-weighing Submission**

General Sampling Procedures

- A review of the basic IH sampling requirements when evaluating employee exposures to chemical and physical hazards in the workplace.



Field Sampling Worksheet
(Draft Version 020802)

NC Department of Labor
Division of Occupational Safety & Health

Inspection Number:	CSHO ID:	Sampling Date:	Sampling #(s):	Cont?
Establishment		Sampling Equipment Type ☐ Air ☐ Noise ☐ Other	Sampling Equipment ID#	
Employee Info: Name			# of Similarly Exposed Employees:	Cont?
Address			Exposure Duration (e.g. # of weeks, months):	
City	State	Zip	Exposure Frequency (e.g. # of hours/day):	
Phone			Photo #'s:	
Job Title	Location		Weather Conditions Temp.	
Protective Equipment Used:	☐Safety Glasses ☐Safety Footwear ☐Hard hat ☐Ear Plugs/Muffs (Make NRR: ☐Gloves Type: ☐Respirator: Type: PF:		Bar. Press. Humidity	

Job Description, Exposure & Engineering Control information: Cont?

Sample Type & Media						
Field number						
Location or Task						
Time On						
Time Off						
Total Sample Time (minutes)						
Flow Rate (liters/minute)						
Total Volume (liters)						
Analyze for: (name or sub. code)						
Mark w/ -(T) for TWA -(S) for STEL -(C) for Ceiling						

Screening Information/Pump Checks				Chain of Custody	Date	Initials
Sampling For:	Equipment ID / #	Time/Location	Result	Shipped to Lab		
				Received in Lab		
				Received by Analyst		
				OSHA Office RID		
				Interferences/Lab Instructions/Blanks		

NCDOL Photo Library

Sampling Media

- Detector tubes
- Aerosol Samplers
- Respirable Dust Samplers
- Solid Sorbent Tubes
- Midget Impingers and Bubblers
- Vapor Badges

Detector Tubes

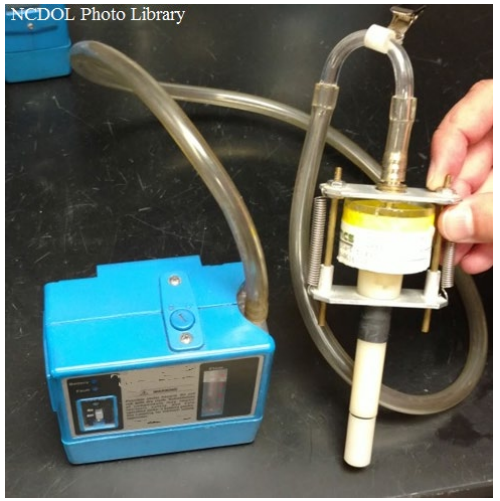
- Screening media that may be used to measure more than 200 organic and inorganic gases and vapors or for leak detection.
- Concentration is determined by a colorimetric change of an indicator which is present in the tube contents
- Detector tubes of a given brand may only be used with a pump of the same brand

Aerosol Samplers

- Total Dust and Metal Fume
- Air Sampling Pumps
  - Total Dust
    - » Pre-weighed, low-ash polyvinyl chloride (PVC) filter
    - » Open-face filter cassette
  - Metal Fume
    - » 0.8 micron mixed cellulose ester (MCE) filter

Respirable Dust Samplers

- Cyclone with a pre-weighed low-ash polyvinyl chloride filter
- Silica
  - Nylon cyclone vs. Aluminum cyclone
  - Submit a bulk sample if possible.

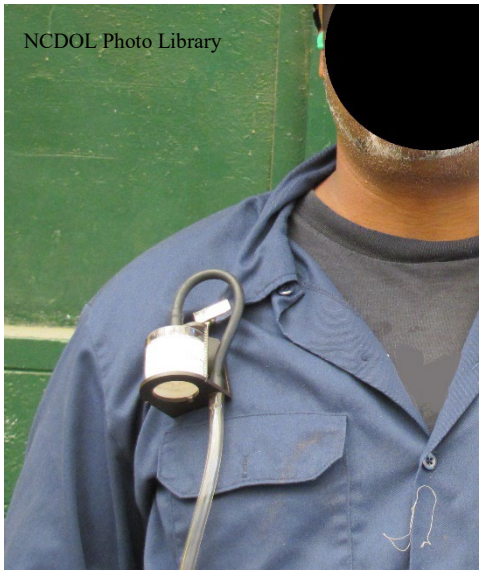


Solid Sorbent Tubes

- Activated charcoal, silica gel, or other adsorption tubes
  - For organic and vapor gases, low flow pumps are required
  - Lower flow rates when there is high humidity (above 90%) in the sampling area or high concentrations of other organic vapors present

Special Sampling Procedures

- Asbestos
  - Use a 0.8 micrometer pore size, 25-mm diameter mixed cellulose ester filter with a back up pad. Use a fully conductive cassette with conductive extension cowl
  - Sample open face
  - Flow rate in the range of 0.5 to 5 L/mi



Special Sampling Procedures (cont…)

- Welding Fumes
  - Filter must be placed inside welders helmet
  - Use 37-mm filters and cassettes
    - » **Note:** The 25-mm filters and cassettes may be used if the 37-mm filters and cassettes will not fit inside the welding helmet.

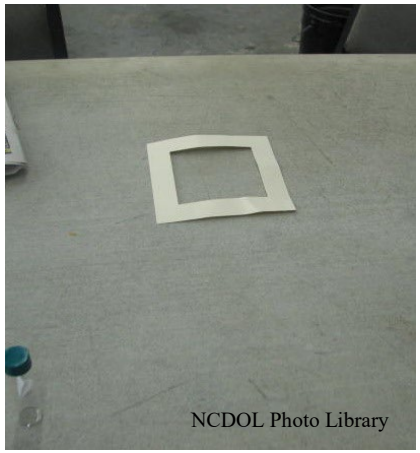
Equipment Preparation & Calibration

- Primary Devices
  - Electronic Flow Calibrators
    - » Drycal
    - » Bubble flow meter
  - Manual Buret Bubble Meter Calibrator

- Secondary Device
  - Rotameter

Section II: Chapter 2

- **Sampling for Surface Contamination**
  - Wipe Sampling, Swipe Sampling, and Smear Sampling
  - Techniques used to assess surface contamination on the skin, work surfaces, and PPE surfaces (e.g., gloves, respirators, aprons, etc.)



Generalized Work Areas

- Where Wipe Sampling is Used
  - Controlled Work Areas Requiring PPE
  - PPE is necessary to prevent dermal exposures to surface contamination
- Controlled Work Areas Requiring Special Cleaning
  - Quality control test of the specialized cleaning (or decontamination) regimen
- Non-controlled Work Areas
  - Assumed to have no significant contamination

Examples

- Media used for Wipe Sampling
  - Glass fiber filters
  - Paper filters – Mixed Cellulose Ester discs or smear tabs
  - Polyvinyl filters
  - Charcoal impregnated pads
  - Other media available, refer to OTM Manual for more specialized cases

Appendices

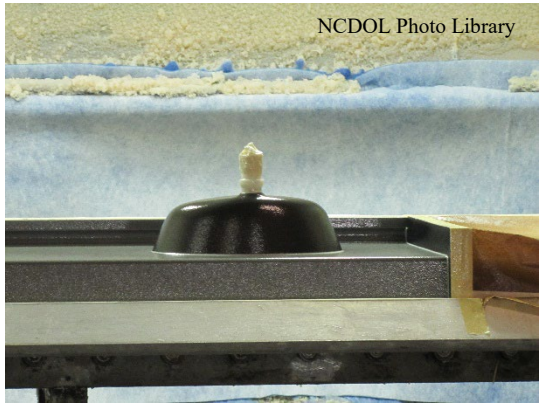
- Appendix II:2-1
  - **Substances with a Skin Notation**
- Appendix II:2-2
  - **Example Procedures for Isocyanates**
- Appendix II:2-3
  - **Example Procedures for Aromatic Amines**

Section III: Health Hazards

- **Chapter 1**: Polymer Matrix Materials
- **Chapter 2**: Indoor Air Quality Investigation
- **Chapter 3**: Ventilation
- **Chapter 4**: Heat Stress
- **Chapter 5**: Noise and Hearing Conservation
- **Chapter 6**: Laser Hazards
- **Chapter 7**: Legionnaire's Disease

Section III: Chapter 1

- **Polymer Matrix Materials: Advanced Composites**
  - Composites industry in the U.S include three manufacturing areas:
    - » Polymer Matrix Composites (PMCs)
    - » Ceramic Matrix Composites (CMCs)
    - » Metal Matrix Composites (MMCs)

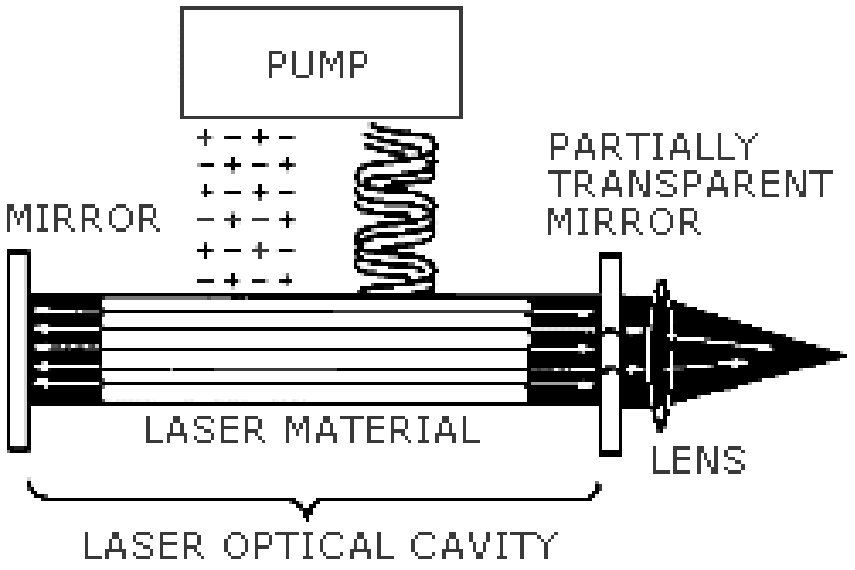


Advanced Composites Health Hazards

- Epoxy Resins
  - Dermal exposure
- Polyurethane Resins
  - Reaction products of polyols and isocyanates (TDI, MDI and HDI)
  - Isocyanates present a respiratory and dermal hazard
- Phenol-Formaldehyde Resins
  - Traces of free formaldehyde and phenol
  - Skin absorption of phenol
  - Adequate ventilation; Components may give off during curing process

Section III: Chapter 6

- **Laser Hazards**
  - Light Amplification by Stimulated Emission of Radiation



Types of Laser Hazards

- Non beam laser hazards
  - Industrial Hygiene
  - Explosion
  - Non-beam optical radiation
  - Collateral radiation
  - Electrical hazards
  - Flammability of Laser Beam Enclosures
- Biological effects of laser beam
  - Eye Injury
  - Thermal Injury

Laser Hazard Classifications

- **Class I** - Low power; lowest hazard
- **Class IA** – (Subclass “not intended for viewing” – supermarket scanners)
- **Class II** – Low power
- **Class IIIA** – Intermediate power – limited controls recommended
- **Class IIIB** – Moderate power – specific controls recommended
- **Class IV** – High power – specific controls recommended

Investigational Guidelines

- American National Standards Institute (ANSI)
- Center for Devices and Radiological Health (CDRH)
- Food and Drug Administration (FDA)
- Occupational Safety and Health Administration (OSHA)
- Council of Radiation Control Program Directors (CRCPD)

OSHA Regulatory Practice

- **29 CFR 1926.54**
  - Non-ionizing Radiation
- **29 CFR 1926.102(b)(2)**
  - Laser Eye & Face Protection

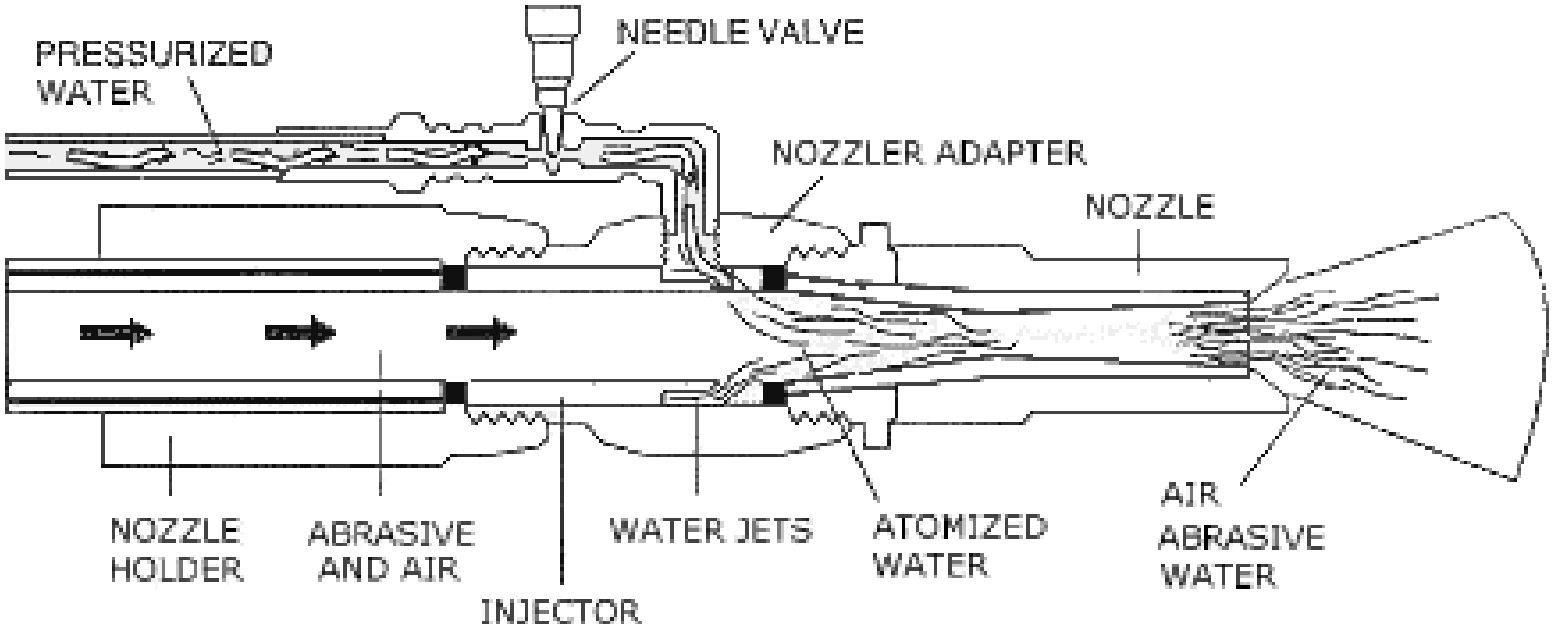
Note: OSHA citations are issued by invoking General Duty Clause

Section III: Chapter 7

- **Legionnaires' Disease**
  - Disease recognition
  - Source identification
  - Investigation protocol
  - Controls

Section V: Chapter 3

- **Controlling Lead Exposures in the Construction Industry:**
  - **Engineering and Work Practice Controls**



Types of Construction Activities

- Abrasive blasting
  - Bridges, tanks, towers, etc.
- Welding, Burning and Torch Cutting
  - Highway/Railroad Bridge Rehabilitation
- Spray painting with Lead- Based Paint
  - Red lead primers
- Manual Scraping and Sanding of Lead-Based Paints
- Demolition
- Other

Engineering &Work Practice Controls

- Engineering Control
  - Ventilation
  - Isolation
  - Substitution
- Work Practice Control
  - Housekeeping
  - Change Areas
  - Other
  - Personal Hygiene
  - Showers

Section VI

- **Health Care Facilities**
  - **Chapter 1:** Hospital Investigations
  - **Chapter 2:** Controlling Occupational Exposure to Hazardous Drugs

Hospital Investigations

- Typical hazards and health effects
  - Biological, Chemical & Physical Agents
- Investigation guidelines
  - OSHA 300 logs
  - Hospital Safety Program
  - Walkaround/Informal Interviews
  - Screening/ IH Sampling
- Controls and prevention
  - Engineering (eg.,Ventilation)
  - Workpractices
  - Personal Protective Equipment (PPE)

Controlling Occupational Exposure to Drugs

- Categorization of drugs as hazardous drugs
- Hazardous drugs as occupational risks
- Work areas
- Prevention of employee exposure
- Medical surveillance
- Hazard communication
- Training and information dissemination
- Recordkeeping

Section VII: Chapter 1 Ergonomics

- Back Disorders and Injuries
  - Back disorders
  - Reports of back injuries
  - Investigation guidelines
  - Prevention and control

Section VIII: Personal Protective Equipment

- **Chapter 1:** Chemical Protective Clothing
- **Chapter 2:** Respiratory Protection

Chemical Protective Clothing

- Description
- Protective clothing selection factors
- General guidelines
- Management program
- Clothing donning, doffing and use
- Decontamination procedures
- Inspection, storage and maintenance
- Training
- Risks

Respiratory Protection

- History of development of respiratory protection
- General information
- Respiratory protection program
- Respiratory selection
- Medical evaluation
- Fit testing
- Use, maintenance and care of respirators
- Breathing air quality and use
- Program Logistics

Summary

In this course, we examined:

- What is the OSHA Technical Manual
- The sections of the OSHA Technical Manual
  - More in-depth look at 6 of the 10 sections
- How to use the OSHA Technical Manual

Thank You For Attending!

Final Questions?