Session 2 Summary: Industrial Hygiene and Environmental Monitoring

Main Objective

Learn how to **recognize, evaluate, and control** chronic occupational hazards to protect workers' long-term health.

Industrial Hygiene: Concept and Importance

- **Definition:** The science of assessing and controlling environmental hazards in the workplace.
- **Difference from Safety:** Safety deals with **immediate** accidents, while Industrial Hygiene deals with **chronic** diseases.
- **Principle:** "Prevention is better than cure" – especially for diseases that manifest after years.

Four Major Environmental Hazards (ANTE)

1. **Chemical:** Vapors, gases, dust, fumes
2. **Physical:** Noise, radiation, heat, vibration
3. **Biological:** Bacteria, viruses, fungi
4. **Ergonomic:** Work design, repetitive motions, heavy lifting

Health Risk Assessment Cycle (RECCE)

1. **Recognition:** What is the hazard? (Identification)
2. **Evaluation:** What is the concentration? (Measurement)
3. **Comparison:** Compare with exposure limits
4. **Control:** Apply prevention measures
5. **Re-evaluation:** Review effectiveness

Occupational Exposure Limits (OELs) – The Safety Compass

- **TWA-PEL:** 8-hour time-weighted average
- **STEL:** 15-minute short-term exposure limit
- **IDLH:** Immediately Dangerous to Life or Health
- **Principle:** Not absolute safe limits, but acceptable limits with a safety margin.

Monitoring Tools

- **Personal Sampling:** Most accurate (represents actual exposure)
- **Direct Reading Instruments:** Immediate results
- **Biological Monitoring:** Measuring substances inside the body

Environmental Monitoring: From Worker to Community

- **Inside the Facility:** Protecting the worker (indoor air quality)
- **Outside the Facility:** Protecting the community (emissions, wastewater, waste)

- **Goal:** Balance between industrial production and environmental protection.

Algerian Legal Framework

- **For Occupational Health:** Executive Decree 91-05
- **For Environment:** Ministerial Orders 06-198 (air), 06-199 (water)
- **Responsibility:** Shared between employer, worker, and the state.

Modern Challenges and Trends

- Mixed hazards (multiple at the same time)
- Emerging hazards (nanoparticles, psychosocial)
- Modern technologies (smart sensors, continuous monitoring)
- Importance of documentation and transparency.

Practical Summary

- **Golden Rule:** "What you cannot measure, you cannot manage"
- **Investment in Prevention:** More cost-effective than treating diseases
- **Engineer's Role:** Designing safe processes from the start
- **Participation:** Involving workers in safety programs.