— University of Mosul —
College of Petroleum & Mining Engineering

Occupational Safety and Health

Lecture 1

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Introduction

The Occupational Safety and Health Administration (OSHA) is the government's administrative arm for the Occupational Safety and Health Act (OSH Act). Formed in 1970, OSHA sets and revokes safety and health standards, conducts inspections, investigates problems, issues citations, assesses penalties, petitions the courts to take appropriate action against unsafe employers, provides safety training, provides injury prevention consultation, and maintains a database of health and safety statistics.

OSHA reinforces the integrated approach by requiring companies to have a plan for doing at least the following:

(1) providing appropriate medical treatment for injured or ill workers.

(2) regularly examine workers who are exposed to toxic substances.

(3) having a qualified first-aid person available during all working hours.

Smaller companies may contract out the fulfilment of these requirements.

Larger companies often maintain a staff of safety and health professionals.

According to A. Hamilton and H. Hardy, the health and safety staff in a modern industrial company may include the following positions:

Industrial hygiene chemist and/or engineer. Companies that use toxic substances may employ **industrial hygiene chemists** periodically to test the work environment and the people who work in it. In this way, unsafe conditions or hazardous levels of exposure can be identified early, and corrective or preventive measures can be taken.

Dust levels, ventilation, and noise levels are also monitored by individuals serving in this capacity.

• ***Radiation control specialist.*** Companies that use or produce radioactive materials employ **radiation control specialists** who are typically electrical engineers or physicists. These specialists monitor the radiation levels to which workers may be exposed, test workers for levels of exposure, respond to radiation accidents, develop company-wide plans for handling radiation accidents, and implement decontamination procedures when necessary.

• ***Industrial safety engineer or manager.*** Individuals serving as **industrial safety engineers or managers** are safety and health generalists with specialized education and training. In larger companies, they may be devoted to safety and health matters. In smaller companies, they may have other duties in addition to safety and health. In either case, they are responsible for developing and carrying out the company's overall safety and health program, including accident prevention, accident investigation, and education and training.

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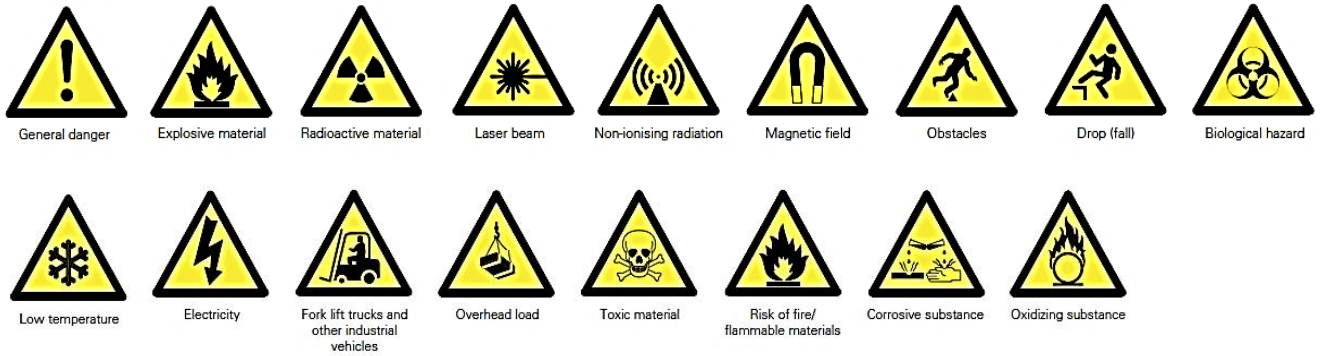
The job of the safety and health professional is more complex than it has ever been. The materials out of which products are made have become increasingly complex and exotic. Engineering metals now include carbon steels, alloy steels, high-strength low-alloy steels, stainless steels, managing steels, cast steels, cast irons, tungsten, molybdenum, titanium, aluminum, copper, magnesium, lead, tin, zinc, and powdered metals. Each of these metals requires its own specialized processes.

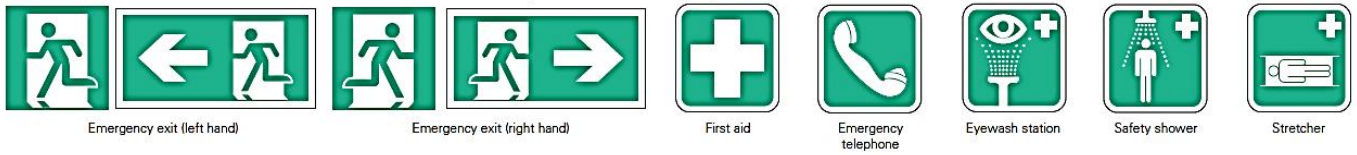
Nonmetals are more numerous and have also become more complex. Plastics, plastic alloys and blends, advanced composites, fibrous materials, elastomers, and ceramics also bring their own potential hazards to the workplace.

In addition to the more complex materials being used in modern industry and the new safety and health concerns associated with them, modern industrial processes are also becoming more complex. As these processes become automated, the potential hazards associated with them often increase. Computers; lasers; industrial robots; nontraditional processes such as explosive welding, photochemical machining, laser beam machining, ultrasonic machining, and chemical milling; automated material handling; water-jet cutting expert systems; flexible manufacturing cells; and computer-integrated manufacturing have all introduced new safety and health problems in the workplace and new challenges for the safety and health professional.

WARNING SIGNS



MEANS OF ESCAPE AND EMERGENCY EQUIPMENT (SAFE CONDITION) SIGNS



FIRE SAFETY SIGNS

MANDATORY ACTION SIGNS

SIGNS FOR GLOBALLY HARMONISED SYSTEM (GHS) OF CLASSIFICATION AND LABELLING OF CHEMICALS