

## Defining Safety Engineering

A Safety Engineer is responsible for major areas relating to the protection of people, property and the environment, including and not limited to:

- Anticipating and evaluating hazardous conditions and practices.
- Developing hazard control designs, methods, procedures and programs.
- Implementing and administering hazard control programs.
- Measuring and evaluating the effectiveness of hazard control programs.
- Drafting future safety plan and statement basing on real time experiences and facts.

A safety life cycle refers to the series of phases from initiation and specifications of safety requirements, covering design and development of safety features in a safety-critical system, and ending in decommissioning of the safety system.

## The role of OSHA

OSHA develops and sets mandatory occupational safety and health requirements applicable to the more than 6 million workplaces in the U.S. OSHA relies on, among many others, industrial hygienists to evaluate jobs for potential health hazards. Developing and setting mandatory occupational safety and health standards involves determining the extent of employee exposure to hazards and deciding what is needed to control these hazards, thereby protecting the workers. Industrial hygienists, or IHs, are trained to anticipate, recognize, evaluate, and recommend controls for environmental and physical hazards that can affect the health and well-being of workers. More than 40 percent of the OSHA compliance officers who inspect America's workplaces are industrial hygienists. Industrial hygienists

also play a major role in developing and issuing OSHA standards to protect workers from health hazards associated with toxic chemicals, biological hazards, and harmful physical agents. They also provide technical assistance and support to the agency's national and regional offices. OSHA also employs industrial hygienists who assist in setting up field enforcement procedures, and who issue technical interpretations of OSHA regulations and standards. Industrial hygienists analyze, identify, and measure workplace hazards or stressors that can cause sickness, impaired health, or significant discomfort in workers through chemical, physical, ergonomic, or biological exposures. Two roles of the OSHA industrial hygienist are to spot those conditions and help eliminate or control them through appropriate measures.

## **Hazards Control**

Engineering, work practice, and administrative controls are the primary means of reducing employee exposure to occupational hazards. Engineering controls minimize employee exposure by either reducing or removing the hazard at the source or isolating the worker from the hazards. Engineering controls include eliminating toxic chemicals and replacing harmful toxic materials with less hazardous ones, enclosing work processes or confining work operations, and installing general and local ventilation systems.

Work practice controls alter the manner in which a task is performed. Some fundamental and easily implemented work practice controls include (1) following proper procedures that minimize exposures while operating production and control equipment; (2) inspecting and maintaining process and control equipment on a regular basis; (3) implementing good house-keeping procedures; (4) providing good supervision and (5) mandating that eating, drinking, smoking, chewing tobacco or gum, and applying cosmetics in regulated areas be prohibited.

Administrative controls include controlling employees' exposure by

scheduling production and workers' tasks, or both, in ways that minimize exposure levels. For example, the employer might schedule operations with the highest exposure potential during periods when the fewest employees are present.

When effective work practices and/or engineering controls are not feasible to achieve the permissible exposure limit, or while such controls are being instituted, and in emergencies, appropriate respiratory equipment must be used. In addition, personal protective equipment such as gloves, safety goggles, helmets, safety shoes, and protective clothing may also be required. To be effective, personal protective equipment must be individually selected, properly fitted and periodically refitted; conscientiously and properly worn; regularly maintained; and replaced as necessary.

## Using PPE

Personal protective equipment (PPE) and the relevant administrative controls are lowest on the hierarchy of control measures. It does not control the hazard at the source and therefore should not be relied on as the main control measure unless it is a temporary or interim measure or when options higher on the list of controls have been exhausted. HOWEVER, PPE can be used effectively in conjunction with other control measures to manage exposure to a risk.

The effectiveness of PPE as a control measure is sometimes limited due to the facts that it can:

- be uncomfortable to wear
- make working difficult
- create other risks to a person's health and safety
- be expensive in the long term

To ensure proper use of PPE, always make sure that