

INDUSTRIAL BUILDINGS AND PLANT LAYOUT

Even less serious injuries resulting from poor housekeeping facilities and congestion of work places can be reduced substantially by preplanning for safety. Layout of equipment and buildings so that production lines do not cross and so that operators have enough working space saves time, increases production, and helps prevent accidents.

Personnel facilities, such as lunch rooms and medical, safety, and disaster services, are essential for reasons of health and treatment of injuries. They can be planned and located for maximum effectiveness.

Codes and standards

The policy of modern companies is to have their safety, health, and fire departments review and check plans and specifications for new or remodeled plants. This saves costly alterations and installations that must be made after a plant is in operation in the event of failure to meet local and state requirements covering fire, accident, and health hazards.

Most ordinances and state laws require that authorized persons approve the means of both normal and emergency egress from buildings. In some states, plans for the installation of emergency lighting and fire alarm systems must be satisfactory to the authorities. Also, in certain states, exhaust and ventilating installations must be approved.

The voluntary safety codes developed by various organizations establish standards for certain structures and equipment. Specifications for the construction of floor and wall openings and railings, for example, are given in a code* developed and published by the American Standards Association. Proper electric wiring and electrical installations are covered in the *National Electrical Code*, issued by the National Fire Protection Association.

Requirements for fire extinguishing equipment and fire protection standards and codes for flammable liquids and gases, combustible solids, dusts, chemicals, and explosives are provided in the *National Fire Codes*, Volumes I through X, developed by National Fire Protection Association.

It must be remembered that "design by the code" is no substitute for intelligent engineering, and that codes only establish a minimum requirement which in many situations must be exceeded.

Planning checklist

The following important features should be investigated, checked, and approved in planning a new plant:

Site planning

Transportation facilities docks and wharves railroad, and roadways

Exits and other wall openings

Floors, walkways, stairs, ramps, platforms

Storage facilities, including those for explosives and flammable materials, for harmful substances, for finished products, and yard storage

Electric wiring and installation

Illumination

Mechanical handling equipment cranes, conveyors, industrial trucks

Elevators

Boilers and other pressure equipment

Ventilation, heating, and air conditioning

Fire control

Health and safety water, waste disposal, first aid, personal protective equipment distribution and repair facilities, isolation of excessively noisy operations

Personal service facilities parking, restaurants, rest rooms, employment, and training

Site Planning

Selection of a site involves consideration of a number of factors: possible hazards to the community and their relationship to climate and terrain, space requirements, type and size of buildings, necessary facilities, transportation, market, and labor supply. Of the factors listed, those of direct concern to the safety man are discussed below. While the safety man is not directly responsible for specialized plant and process engineering and design, still it is his duty to keep the engineers and architects as safety conscious as possible, and to anticipate potential safety hazards and try to have them "designed out" of the system before the construction stage begins.

*American Standards Association, 10 East 40th St., New York City *Safety Code for Floor and Wall Openings, Railings, and Toe Boards*. A12