

AMSE13 PLANNING AND DESIGN OF FIRE PROTECTION SYSTEMS

UNIT-1 FIRE DETECTION

- 1.1 Need and importance of automatic fire detection system,
- 1.2 Principle of detection, classification of detectors;
- 1.3 Heat detectors – fixed temperature, rate of rise ,
- 1.4 Thermistor rate of rise and rate compensated type detectors;
- 1.5 Smoke detectors- optical and ionization type, photo electric light scattering and light obstruction type detectors; Flame detectors – infra red and ultra violet detectors;
- 1.6 Flammable gas detection- Pellistor and laser detectors;
- 1.7 Testing of fire detection devices as per relevant Indian standards specifications;
- 1.8 Comparison of detectors;
- 1.9 Performance characteristics of detectors; Lag time associated with fire detection.

UNIT-2 PRINCIPLES OF FIRE EXTINGUISHMENTS

- 2.1 Extinction of premixed flames,
- 2.2 Diffusion flames and burning metals, fire triangle, fire tetrahedron;
- 2.3 Basic concept of fire fighting with water, carbon dioxide, powders, foams, inert gases halons;
- 2.4 Need for halon replacement and halon substitutes;
- 2.5 Extinguish ant performance- flame extinguishing concentration,
- 2.6 Inerting concentration, and fire trials.
- 2.7 First aid fire protection- fire bucket, sand bucket, fire blanket, fire pails & water barrels, hose reels;
- 2.8 Description, working principle, method of operation of different types of portable fire extinguishers water type, foam type, dry powder type, CO₂ type,
- 2.9 Vaporizing liquid type; Care, inspection, and maintenance of portable extinguishers as per relevant Indian standards specifications;

UNIT-3 AUTOMATIC WATER SPRINKLER SYSTEM

- 3.1 Requirement and source of water supply, automatic pumps;
- 3.2 Automatic sprinkler heads- Quartzoid type, fusible link type, modern types;
- 3.3 Mounting and protection of sprinkler heads;
- 3.4 Sprinkler pipe works-standard and staggered lay out, hangers;
- 3.5 Control valves for wet and dry installations; deluge valve.
- 3.6 Drenchers; High velocity and medium velocity spray system;
- 3.7 Principles of water sprinkler system design as per relevant standards (ISI).

UNIT-4 FIXED FIRE FIGHTING SYSTEM

- 4.1 Using CO₂, Dry chemical powder, and Foam
- 4.2 Concept of total flooding and local application, advantages and disadvantages of each system;

- 4.3 Basic system components;
- 4.4 Design principles of fixed firefighting systems for total flooding and for local application as per relevant standards (ISI).
- 4.5 Fire alarm system- classification of alarm system as per NBC;
- 4.6 Manually operated system;
- 4.7 Automatic alarm system;
- 4.8 Component and features of Local system,
- 4.9 Auxiliary system,
- 4.10 Remote station system, Central station system and Proprietary system

References Books:

1. RonHirst, "Underdowns Practical Fire Precautions", Gower Publishing Company Ltd., England, 1989.
2. Jain V.K., "Fire Safety in Buildings", New Age International(P)Ltd.,NewDelhi,1996
3. Clark, W.E., "Firefighting principles & practices",
4. HMSO: Manual of Firemanship, No. 4 to7.
5. Kevin Cassidy, "Fire Safety and loss Prevention",

