3.8. Deluge Water Spray Systems

3.8.1. The requirements for Deluge Water Spray System material, design, installation shall be as per **Table 9.10.,** Applicable Sprinkler requirements of **Table 9.7.** and the General Requirements of **Table 9.3.**

Table 9.10: Automatic Deluge Water Spray System Requirements

ITEMS	REQUIREMENTS
1. DEFINITION	i. A water spray system is a special fixed pipe system connected to a reliable supply of fire protection water and equipped with water spray nozzles for specific water discharge and distribution over the surface or area to be protected. The piping system is connected to a water supply through a deluge valve that can be actuated both automatically and manually to initiate the flow of water. Automatic system actuation valves for spray systems can be actuated electrically by the operation of automatic detection equipment, such as heat detectors, relay circuits, and gas detectors, or mechanically by hydraulic or pneumatic systems, depending on the operating mode of the individual valves. ii. The Deluge System application could be to extinguish fires, control burning, fire exposure protection (Cooling) or prevention of fire. The pattern of the water spray discharged from spray nozzles onto a surface may be elliptical or Circular, and the cross section of the projected discharge is conical. The water spray is forcefully directed onto the object or surface being protected. The pattern of spray nozzle discharge must carry water spray over the distance between the nozzle and the target, compensate for wind and draft conditions, and effectively hit the surface to be protected. The required discharge density in gpm/ft2 (L/min/m2) and complete coverage of the area to be protected are also essential elements. iii. LPG Tanks, Flammable Gas/Liquid Tanks, Electrical Hazards such as transformers, Oil switches, motors, cable trays/ Trenches, Service Tunnels, Transport Tunnels and other such hazards shall be provided with Deluge Water Spray System.
2. COMPONENTS	i. Fire Pumps, Controller, Fire Water Tank, Pipes, Fittings, Nitrogen/Air Supply , Spray Nozzles, Isolation valves, Deluge Valve, Pressure gauge, Flow Switch, Test connection, Drains, Breeching inlet and Signs. ii. All components of pneumatic, hydraulic, or electrical systems shall be compatible, listed and approved by Civil Defence. iii. System components shall be rated for the maximum working pressure to which they are exposed, but not less than 12.1 bar (175 psi).
3. FIRE PUMPS	i. The fire pump set shall consist of 1 Electric driven pump, 1 diesel driven pump and 1 electric Jockey pump, complete with controllers. ii. The pump capacity shall be as per **Section 4.**
4. WATER SPRAY NOZZLES	i. Nozzles shall be open, listed and approved. ii. Selection of nozzles shall be based on discharge characteristics, hazard evaluation, ambient conditions and manufacturer's instructions regarding positioning and coverage.
5. DELUGE VALVE	i. The deluge System actuation valve shall be located as close to hazard protected as possible upon evaluation of hazard factors such as radiant heat flux, potential explosions, accessibility, discharge time and, drainage arrangement such as dikes, bund walls, trenches etc.