SPECIAL EXTINGUISHING SYSTEM REVIEW

INTRODUCTION

Special extinguishing system designs are of the pre-engineered or the engineered type. **Pre-engineered** systems are designed for hazards within certain limitations. Piping, fittings and nozzles are generally required to be within maximum and minimum limitations. **Engineered** systems, on the other hand, are usually computer designed to fall within the established design specifications. The pipe sizes and discharge devices are designed to deliver an overall uniform concentration or minimum delivery rate. Both types of systems require a thorough review prior to installation.

POSITION

All equipment essential to the proper operation of the extinguishing system must be listed by a nationally recognized testing laboratory, such as Underwriters Laboratories (UL). If not listed, the manufacturer must be actively pursuing a listing at a laboratory acceptable to the AXA XL Risk Consulting. In the latter case, the installer must agree to update the installed equipment to conform to the requirements needed for listing without charge to the user.

Use one prime contractor for all features of the protection system rather than contract separately for various portions of the system.

The system designer should prepare data so that it can be reviewed with a minimal time expenditure. The piping plans and the supporting calculations should concur.

Plans for review must address the following **general items** for both pre-engineered and engineered systems:

- Scaled plan and section view drawings to confirm that the volume is within design limitations;
- Location of the containers, control panel, detectors, manual releases and other essential components;
- Detailed layout showing size and placement nozzles;
- Complete bill of materials so that listing for the intended use can be confirmed;
- Time required to discharge system;
- Electrical plans showing the arrangement of the control unit, power supply, and point-to-point electrical wiring of all equipment;
- Reserve power details with calculations to confirm sizing;
- Details on ventilation interlocks, damper and door closure, equipment interlocks, time delays and alarm devices;

- Sequence of events, indicating operation of system under normal and emergency conditions as well as details on the purpose and operation of system time delays and aborts and location where instructions will be posted;
- Analysis of environmental factors such as:
  - Ventilation equipment
  - Heat and smoke removal system
  - Combustible loading
  - Construction materials
  - Presence of sprinklers
  - Protective signaling service availability
  - Especially enclosure tightness

Include the following items for **pre-engineered** systems:

- Design factors and design limitations with references to the specific pages and plates from the manufacturer's design manual.
- Maximum area, maximum volume, weight of agent, maximum pipe length, type of pipe, number of fittings allowed in the specific design, and the routing of the piping in sufficient detail. Verify that the system does not exceed the piping limitations of the listing.

Do not use multiple systems to protect large areas unless the equipment listing allows it. Arrange all containers used for protection of a specific area for simultaneous release.

Flow calculations are not required.

Include the following items for **engineered** systems:

- Agent flow calculations. Complete input/output data should be provided and should include sufficient details to aid in the verification of calculations and nozzle selection.
- Isometric sketch of the piping layout with the submittal. Indicate the size and length of pipe, type of pipe, elevation changes and the location of reference points used in the calculations.

DISCUSSION

AXA XL Risk Consulting considers all phases of protection before formal recommendations are presented and confirms that the agent used is the most suitable for the proposed application.

The special extinguishing industry has established a system designer's certification program under the auspices of the National Institute for Certification of Engineering Technologies (NICET). Certification is an acceptable means of evaluating designer and installer competency.

Listing agencies do not review the internal workings of computer programs. They confirm the programs' operation during the listing procedures during instrumented discharge tests.