

Some Fire Protection and Explosion Suppression Aspects of Damage for Buildings, Plants and Equipment

Explosion Suppression
New Generation Sprinkler Heads
Building & Life Safety Codes



Damage Engineering INSIGHTS

commercial • energy • infrastructure • manufacturing

Fire protection and explosion suppression systems provide life safety and protection to property and operations. They are designed to detect, control and/or suppress fires and/or explosions, and to alert affected persons and responders. Some Damage Engineering insights:

CAUSE

You are probably familiar with how fire protection systems work; explosion suppression is much more sophisticated.

Typically *explosion suppression* systems either chemically interfere with the explosive reaction or thermally remove heat from the reaction. These systems operate within milliseconds to:

- Detect a flame, spark, or pressure change of a developing explosive reaction
- Release suppressant
- They may also automatically isolate the affected areas to prevent the flame front from traveling to other equipment, or travel through process piping or ductwork

Explosion suppression systems may supplement:

- Inerting systems that typically use compressed gas to displace the air or oxidant thereby reducing the likelihood of an explosive reaction
- Explosion venting which can be as simple as frangible panels in the building or equipment which act like a safety valve to prevent an excess rise in pressure or a more complex approach to pressure rise involving vents that are opened by detectors

COST

Just as computer capacity is often “replaced” by fewer, newer, cheaper and more powerful computers, design breakthroughs in fire protection sprinkler head design are creating a *new generation of sprinkler heads*.

One of the first is called ESFR (early suppression fast response) sprinkler heads with spray patterns that cover more volume and surface area. Unlike new computers, the ESFR sprinkler heads, themselves, are more expensive; the savings come from a reduction in piping and fittings.

The spray pattern of ESFR sprinkler heads can eliminate the need for intermediate sprinkling between the floor and ceiling — allowing ceiling-only protection. They were developed to minimize the cost of fire damage to contents such as commodities and stored items in warehousing and “box store” retail locations high rack storage.

Look for similar sprinkler heads being developed that will reduce the cost to replace damaged sprinkler systems in manufacturing and energy locations.

DOWNTIME

Damage to fire and explosion protection equipment can usually be repaired more quickly than other building and equipment damage. An exception can be additional work scope involving changes in the *building & life safety codes* since the system was originally installed.

When the building repairs are extensive and work associated with changes in the codes is a consideration for you, ask early on about the likelihood of additional code compliance work and listen for the approach being taken to:

- Required design changes
- Procurement of additional components
- Their associated installation

Listen for how these activities are being sequenced to minimize the likelihood of the protection and suppression systems code compliance activities being on the critical path. (The “critical path” is the longest sequence of repair activities and hence determines the downtime duration. On a heavily compressed repair project, there are often several potential critical paths.)



An example of a standard sprinkler head.

Cause
Cost
Downtime

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