

LOSS LESSONS

VOLUME 6

ALLIANZ GLOBAL CORPORATE & SPECIALTY®

A SPRINKLER HEAD SAVES A FACTORY

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Occupancy:

Pyrotechnics

Property Damages:

€ 20,000

Business Interruption:

None

Maximum foreseeable loss (MFL*) at the site

€ 27,000,000 in property damage and 6 months of production shutdown

*Maximum Foreseeable Loss is defined as the largest loss that may be expected from a single fire or explosion to any given property, when the most unfavourable circumstances are combined and when as a consequence, the fire is not fought and therefore is only stopped by impassible objects or lack of sustenance.

CIRCUMSTANCES

The site, classified as SEVESO II (European legislation on major hazards), is entirely devoted to assembly work on pyrotechnics. The process is divided up between some thirty small buildings, which is normal for this type of industry. Certain areas are reserved for the pyrotechnical machines. The land is entirely fenced in and isolated from any other businesses. Site operations mainly take place from 7:30 a.m. to 4 p.m., Monday-Friday. Nevertheless, two security guards are present 24/7 at the guard station where all of the fire and intruder alarms go off.

On a Wednesday, at around 5 a.m., an alarm goes off at the guard station, stemming from a sprinkler system in a building devoted to pyrotechnical work, approximately 2,000 m² in surface area. At that very moment, one of the security guards is doing monitoring rounds on the site. Alerted by his colleague at the guard station, he

immediately goes to the location in question. He there finds that a utility room is completely filled with smoke and that a sprinkler head has been triggered. The sprinkler alarm triggered automatic shutdown of the utility installations (4 air handling units) and simultaneously closed the fire dampers in the air ducts.

The 64 m² utility room had a 2-hours fire cutoff rating. The pass-throughs for cables, ducting and other services were completely sealed off using fire cutoff materials with specifications similar to those of the walls. The equipment contained in the room was as follows: air handling units (HVAC), electric distribution cabinets, inverters, power cabinets, humidifiers, building management systems (BMS), etc.

An entry opening detector and a motion detector are also installed at that location.

At the same time, the security guard at the guard station followed the prescribed emergency procedures:

- 5:12 a.m.: He called the internal emergency crew and the fire department, as well as site management. Once on site, the emergency action crew shut off electric power to the building and found that the initial fire had been put out by the sprinkler system
- 5:35 a.m.: By the time the fireman and the General Manager arrive, the risks are under control. A joint decision is made to close off the control valve for the sprinkler system in question, but the remaining sprinkler systems are left in operation. The fire department then left
- 6:15 a.m.: The on-call maintenance crew shows up at the site
- 7:15 a.m.: Directions are given to limit communication of the incident to the outside
- 8 a.m.: The utility room is returned to operation after isolating the damaged air handling and humidifying systems. When they arrive for work, the employees find almost normal operations under way
- 3:00 p.m.: The sprinkler system in the damaged area is repaired on and the control valve for the sprinkler system in question is re-opened

CAUSE OF THE LOSS

Hypotheses concerning an act of vandalism or the results of hotwork are discarded due to the absence of a triggered intruder alarm or previous work being done in that area.

The fire seems to have started due to electrical causes related to a short circuit in the humidifier. The humidifier's fuses had not blown. The initial fire spread to the adjacent cable runs (for a length of about 4 m) and to the rest of the humidifier, as well as to an air conditioning housing located above it.

EXTENT OF THE DAMAGE

The fire was quickly kept from spreading and was put out by means of a single sprinkler head. There was relatively little damage. Only the humidifier, the thermal insulation on an A/C unit and the BMS circuit boards present in the utility room were damaged, and there were no business interruption losses since every effort was made to return to business as usual when the employees began work.

WHAT HAS WORSENERED THE LOSS

Pyrotechnic production requires controlled humidity levels, provided by the air from the HVAC units. A humidifier is therefore located next to the A/C duct housings. The humidifier is comprised of a closed chamber where water is sprayed onto an electric coil to produce water vapor. The water vapor is then injected into the HVAC.

The fire was caused by the failure of the fuses following the short circuit on the humidifier. The presence of combustible electrical components: electric wiring runs, plastic materials, and of combustible insulation of the A/C ducts (polyurethane foam) contributed to spread of the fire beyond the humidifier.

WHAT HAS LIMITED THE LOSS

Quick and effective operation of the sprinkler, the fire cutoff construction of the utility room (walls, ceilings, fire-dampers in the ducting, sealing of the pass-throughs for pipes, wiring and other services), alarm reporting at a continuously manned station and automatically triggering shut down of technical facilities and the presence of personnel on hand equipped with pre-established and tested emergency procedures, all served to limit the amount of damage. One should also cite the placement of a protective layer of plaster over the insulation (polyurethane foam) of the A/C ducting, which nevertheless slowed the spread of heat and flames in the insulation.

The use of emergency procedures and the existence of employees on call allowed the facilities to be quickly returned to operation and thus avoid business interruption losses.

COMMENTS AND LEARNINGS

The presence of a reliable and efficient sprinkler system. We should note that, in France, nearly 80 % of fire extinguishing due to sprinkler systems occurs with the triggering of 5 sprinkler heads or less.

It is necessary to quickly return sprinkler systems to operation following a fire in order to restore the previous level of protection to the area damaged (especially since repair work in these zones often generates greater fire hazards).

The fire cutoff construction of utility rooms (at risk) to isolate the means of production or storage areas from the risks of fire and/or explosion that are inherent to these areas.

The installation of automatic smoke-detection systems in sensitive or strategic locations (e.g., electric utility rooms) provides a warning as soon as smoke appears and thus allows one to intervene even sooner. At the site in question, this improvement was made following the fire.

Installing properly calibrated magnetic/thermal circuit breakers is more effective than using fuses for protection from short circuits. This type of protection should be supplemented by a differential breaker that can eventually provide earlier cut-off as soon as stray current is detected.

Conducting infrared thermographic inspections is a good means of prevention for detecting overheating in electrical and mechanical systems, or of detecting steam leaks and other defects that constitute extreme heat sources. This improvement was also made at the site following the fire.

Setting up maintenance crews that are on-duty or on-call 24/7 often helps considerably in reducing business interruption losses due to fires.

QUESTIONS OR COMMENTS?

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Reference LL 06/18/05



↑ The resistance-coil laden cover on the humidifier where the fire broke out



↑ The damaged humidifier and A/C casing

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