LOSS LESSONS

VOLUME 11

ALLIANZ GLOBAL CORPORATE & SPECIALTY®

FIRE IN A PAINT BOOTH

REPORT PUBLISHED BY

ALLIANZ RISK CONSULTING

Occupancy:
Automobile assembly lines

Property Damages:
€ 3,900,000

Business Interruption:
€ 870,000

CIRCUMSTANCES

On August 12, while the factory was shut down for annual maintenance, an operator was working alone in the pit of the water curtain on a painting line.

The hot work permit had been issued according to the company's procedures, after having been rejected initially, the loss prevention department having requested an additional cleaning before authorizing hot work operations.

At approximately 5 p.m., a fire breaks out in the pit.

The plant emergency teams act quickly, using fire hose reels, and manage to keep the fire from spreading to a nearby paint booth.

During this time, the automatic sprinkler system activates inside the booth first and then also at ceiling level.

The fire brigade arrives 25 minutes after the fire had started and attacks the fire using foam. At around 6 p.m., the dilution shop foreman begins shutting off the 13 circulating system pumps (the system that distributes the paint and solvents) one by one. The fire is put out at approximately 7 p.m.

For the record, within 2 hours:

- 84 sprinkler heads were triggered and dispersed 1,000 m3 (264,200 gal.) of water
- 600 - 800 m3 (158,000 - 211,300 gal.) of water was dispersed by the fire hose streams

CAUSE OF THE LOSS

The most likely explanation for the cause of this fire is the ignition of flammable liquids due to a leak in the distribution system that encountered a hot spot.

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WHAT WORSENED THE LOSS

The absence of an interlock between the operation of the sprinkler system and the closing of the valves on the paint (flammable liquids) circulating system lead to continuous supply of the fire for over an hour, contributing to its spread.

WHAT LIMITED THE LOSS

First, quick action by the plant emergency teams prevented the fire from spreading to other booths.

Second, the operation of the sprinkler system contributed to fighting the fire, even if twice the number of sprinkler heads were activated, compared to the sprinkler design area of operation.

Finally, the prompt response of the staff after the fire, including the installation of manual paint stations and the execution of major works in record time, enabled production to return to full output on the target date, thus limiting business interruption.

COMMENTS AND LEARNINGS

This type of incident serves, once again, to emphasize the danger of using flammable liquids equipment in the presence of ignition sources related to maintenance work.

Remember that each internal staff member or external contractor shall be trained to the fire risks related to operations on such equipment.

In the present case, it is therefore critical when a fire breaks out to cut off the entire liquids distribution system as soon as possible. This cut-off operation must be possible both manually and automatically:

- Manual cut-off by means of an emergency shut-down button remotely located and easily accessible in case of fire. It is also important to designate someone in the workshop as being responsible for and authorized to make this cut-off (for example if the automatic shut-down fails). Furthermore, a periodic check of qualified employees' knowledge of these cut-off points needs to be made
- Automatic shut-down by an interlock between the operation of the sprinkler system (or activation of a fire detection system, if present) and the closing of the valves on the paint circulating system should be installed

Additionally, an interlock between a pipe leak detection system and the closing of the paint circulating system is also recommended to be put in place.

Lastly, it is recommended that the sprinkler systems supplying both the paint booths and the paint preparation area, where increased fire risks exist due to the continuous presence of flammable liquids, be supplemented by a film forming foaming agent, as water alone can rarely control a fire of these types of products being often non-water miscible.

Remember that in the automotive and aircraft industry, different types of paints are used and the flammable liquids of their solvent base can be comprised of various types of products like toluene, ethanol, propanol, butanol, ketones, etc.

It is important to be aware that one litre (0.3 gal) of toluene releases about twice the energy when burning than 1 kg (2.2 lb) of wood (30 MJ/kg compared to 14 MJ/kg).

QUESTIONS OR COMMENTS?

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