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THE ROLE OF LOSS PREVENTION IN RISK MANAGEMENT

C.V. PARDON

AEAI

Omer Leroy
UNILEVER
Conference Co-Chairman

Risk and Insurance Management Society, Inc.

Hugh Loader
Tetra Pak
Conference Co-Chairman

Insurance companies have in a sense been practicing risk management for many decades.

An underwriter who was offered a risk was setting his self retention according to the hazard grade and class of risk in line with the corporate guidelines.

The more hazardous the risk the less retention he was keeping and the more he was reinsuring.

The hazard grade and class of risk is in relation to the nature of the risk.

All industrial risks can be grouped in different classes, such as : woodworkers, metalworkers, machine shops, textile mills and many others.

Without having more information the underwriters tended to be conservative and were treating, for example a good paper plant equal to a poor paper plant.

It is obvious that this is not the proper way of doing business. In order to be able to retain more premium on a good risk and eventually make more profit they needed more information about the risk.

Since in general the technical background of the underwriters was limited engineers got involved and where asked to visit the factories and prepare detailed reports.
The loss prevention engineer was born.

In the further development of the loss prevention services the underwriter became more demanding and wanted an estimate on how much they could lose in a loss resulting from a fire or other peril.

If the insurance manager starts to play the role of the underwriter and wants to increase the deductible thus reducing the insurance costs, he is making his first steps into the risk manager's field.

The risk managers function can be summarized in the following 5 points as follows :

1) Identification of the exposures his company is facing.

2) Evaluation of the risk.

3) Quantification of the possible loss.

4) Elimination or reduction of the loss exposure.

5) Auditing at regular intervals to update the exposures and installed prevention and protection.

In each of the above points I will highlight the loss prevention aspects.

Identification of the exposure:

Exposure from outside. Neighboring plants can present a severe exposure which should be brought to the attention of the risk manager. Hazardous processes or storages are mostly located away from the main operation or close to the property limit within legal conditions thus exposing the neighbor.

Smoke from forest fires or toxic fumes from neighboring industries can be drawn into the air-conditioning systems of high tech plants and contaminate and shut down the clean rooms.

Exposure risks can also result from railroads, from road trucks or from taking off or landing aircraft.

Internal exposures are more obvious and in direct relation to the type of industry. The fire and explosion hazard in a metalworking plant are low but the accident and health hazards can be severe.

Each and every operation should be analyzed and checked for any loss exposure, be it property, liability including casualty and pollution,business interruption or any other.

It would be difficult to enumerate all the process hazards here , without missing one. But I would like to mention a few. Process hazards can be contained in chemical reactions, handling of flammable liquids, handling of explosive dusts, process heating systems, drying ovens and gas fired furnaces.

Very important at this point are the equipment safeguards and prevention features.
Are they properly installed and maintained or are they just ornaments?
But hazards are not only related to the process, they can also result from the the manner in which products are stored.

For example the storage of products on pallets and on racks is more dangerous than the storage of the same products in solid piles.
Vertical storage of rolled paper presents a severe fire hazard.
The use of plastics as packaging materials introduces hazards not related to the process itself.

Other hazards not related to the production can be found in the construction. The use of combustible construction materials and the large buildings without any fire walls or cut offs. Modern industrial buildings are now of very light non fire resistive construction and mostly windowless.

This renders manual fire fighting very difficult and almost impossible with the results that fire brigades in these days are often forced to only protect the surrounding buildings and not control the building on fire.

The second function is <u>evaluation of the risk</u>.

First a risk can be evaluated as poor or good or insurable or decline etc....
I have always used one of the following evaluations : excellent, good, fair and poor. And I have always used four because if one uses three or five it is most tempting to use the middle one to satisfy everybody.
A risk should be evaluated in its class, like we used to say, compare apples with apples and pears with pears.

Criteria used to come up with an evaluation are housekeeping, managements attitude, smoking control, safety programs, training of employees, maintenance of fire protection equipment etc.

General interest and attitude of plant people with respect to insured hazards and prevention of loss is a matter of extreme importance.

Excellent management attitude is a major requisite to an excellent loss ratio.

Obvious employee laxness or disinterest in housekeeping, smoking regulations, cutting and welding practices, valve supervision in fire protection systems indicates weak managerial supervision.

The third function I would like to touch upon is quantification of the possible loss and this is probably the most important for the risk manager.

The quantification of a possible loss is the evaluation of the dollar value of the largest loss under well determined circumstances to a given peril.

The insurance industry uses a variety of terms and methods in this area. The most frequently used terms are:

AS : Amount Subject
MAS : Maximum Amount Subject
MFL : Maximum Forseeable Loss
PML : Probable Maximum Loss
Possible Maximum Loss
NLE : Normal Loss Expectancy
EML : Estimated Maximum Loss
SMP : Sinistre Maximum Possible
SRE : Sinistre Raisonnablement Escomptable

The interpretation of these terms may differ from company to company. The definitions range from the most pessimistic to the most optimistic but I would like to define four steps which can be clearly defined.

They are:

a) AS. Amount Subject
b) MFL. Maximum Forseeable Loss
c) PML. Probable Maximum Loss
d) NLE. Normal Loss Expectancy

I would like to define the four steps as follows:

The amount subject is 100% of one building unless the building is divided by a blank 30cm thick wall extending from the basement to above the roof with a 75cm parapet.

If the plant or risk is composed of several buildings the amount subject is equal to the largest building and any building within a certain distance. This distance is dependent upon the type of construction of the facing walls and height of the buildings.

The maximum foreseeable loss is defined as the amount of a loss that can be anticipated due to fire or explosion, with all fire protection out of service and with no fire fighting effort.

The MFL is 100% unless;
the building is subdivided by a 30cm thick blank wall extending from the basement to above the floor or if different buildings are separated by ascertain distance as mentioned before and, now we come to the difference with the AS, the fire load is such that it is impossible to have a total loss. Other positive features such as salvageability, no continuity of combustibles, fire resistiveness and structural integrity of the building should be considered.

With the PML definition we come even closer to the reality. It is defined as the amount of a loss that can be anticipated due to a fire or explosion with existing protection in service.
Again fire walls can be considered to reduce the PML, and in this case the wall may have openings if protected with double fire doors. The separation between buildings as well as the fire load, combustibility, salvageability is considered as for the MFL.

In addition to this we consider the fire protection in service, public and private fire brigades as well as fixed manual and automatic systems but this is not without any rigid conditions.

Fixed manual and automatic protection systems can only be considered when they are adequately sized and designed and when they are reliable. Each company can now set up its own condition for adequacy and reliability.

We are very flexible in this field and do accept local country codes and standards.

The NLE or normal loss expectancy is the estimated loss when all systems function properly and without any adverse conditions. This means that the fire is controlled by the available fixed extinguishing systems. This amount is usually limited to a few 100 m2 or for example a few piles in the warehouse. The obtained figure is mostly used to determine a deductible.

Function number four is the elimination or reduction of the exposure. Elimination of a risk is not always possible for obvious reasons. Paper is made from wood, which is combustible, and unfortunately for our forests no substitute has been found yet. In some instances a flammable solvent can be replaced with a non flammable liquid but which in turn could be highly toxic or present pollution problems.
The elimination of combustible insulation materials in construction would definitely eliminate a risk.

An exposure can be reduced by installing safeguards on the equipment, by providing preventive measures in the environment, by segregation of the process, or by installing fixed protection systems.

By safeguards I understand preventilation in an oven to avoid accumulation of flammable vapors, grounding to avoid static sparks, temperature limiting devices to prevent overheating and many others.

Preventive measures in the environment could be explosion proof electrical equipment, floor level exhaust ventilation to remove the flammable vapors from the room, pressurization of a control room to prevent flammable vapors from entering and others.

If the hazard exposes other operations it is advisable to separate the different operations with fire walls and doors or to separate the storage areas from the process. Unfortunately the trend is to eliminate fire walls entirely, thus manufacturing , processing and assembling areas are exposed by raw and finished products storage and vice versa.

The best we can hope for is to isolate special hazards by locating them in detached buildings or enclosing them with fire walls, but here again we are met with resistance because of the modern production line methods utilizing overhead conveyor systems and automated storage systems.

Trends in industry change to an increasing use of plastics which increases the combustibility of the stored commodity.

In order to preserve an Ozon layer, the trend in aerosols is now to replace the non combustible halon propellant gas by highly flammable hydrocarbons increasing the hazards.

As far as protection is concerned there are manual and automatic systems and fixed installations and mobile installations. Fire extinguishing systems should be adapted and designed for the occupancy to be protected. Extinguishing systems have their limitations and it is the job of the loss prevention engineer to recommend the most appropriate type.

For example gas extinguishing systems such as carbon dioxide or halon are suitable for electronic equipment contained in cabinets or small rooms, because for successful extinguishment the gas concentration in the room or enclosure has to be maintained for a certain period of time and in large storage areas were these systems have been used this is virtually impossible. In the same scope as previously mentioned, for environmental purposes, the installation of halon has extinguishing systems is being discouraged and we do not anymore recommend live halon discharge tests for acceptance of extinguishing systems.

Foam extinguishing systems are very efficient when properly designed and installed but they have their limitations as well. They are suitable for petroleum and petrochemical industry fires but they are not suitable for ordinary industrial plants.

For industrial plants and most commercial properties, the best known and proven means of fire protection is automatic sprinklers. They may be compared to a number of fire men stationed one per 10m2 on the alert every hour of the day and every day of the year ready to go into instant action and never forced to retreat because of heat or smoke.

The advantages can be summarized as follows:

When the fire starts, sprinklers open. Every fire has a small beginning, the sooner it can be attacked the better the chance of success.

They strike at the seat of the fire. The automatic sprinklers which operate are the ones directly over the fire and its immediate vicinity.

They operate in the midst of the heat and smoke. They are much more effective than hose streams particularly when streams must be directed blindly through windows from outdoors, with no certainty that water is reaching the seat of the fire.

They are always ready at all points. Automatic sprinklers eliminate the human delays and mistakes in attacking a blaze at the start.

They eliminate unnecessary water damage. Only those heads open which are needed.

But I am not here to sell sprinkler systems, nevertheless I would like to stress the advise that only the experienced loss prevention engineer will be able to recommend you the appropriate extinguishing system, beware of good salesmen whom their only aim is to sell equipment.

A new development in the fire protection field is the ESFR Sprinkler head (early suppression and fast response). This head has been developed to cope with fire hazards of increasing severity. Standards have now been published for their use.

The 5th and last risk management function is Auditing at regular intervals.

When the first visits have been done, reports have been completed, recommendations submitted and some of them complied with, follow up surveys should be made.

The follow up is required to check if any changes have taken place. The firm may produce a new product which creates greater liability or fire exposures than those faced in the past. The loss estimates may have to be revised because of new investments and at the same time the newly installed prevention and protection features should be checked.

Safety and loss prevention training programs should be checked. In how far are the fire protection testing and maintenance programs implemented? Hardware without any suitable software is useless.

Once the prevention and protection systems are installed employees should be trained in their operation and use and the systems should be regularly tested and maintained.

To conclude I would like to say that loss prevention is not a secondary item that loss prevention engineering is not a task that can be carried out by any other engineering branch.

In our present industrial environment loss prevention engineering stands at the same level as the other engineering branches.

When plans are developed for a new factory a loss prevention engineer should be consulted, the tasks of advising what and where prevention and protection should be installed should not be left to the project manager watching his budget or to the architect too often involved with esthetics. It will not be the electrical contractor who will be designing and installing the heating and ventilating equipment.

Ask a loss prevention engineer to review the project, evaluate the exposures, and advise you on prevention and protection.

Loss prevention is vital for the risk manager. In a sense the functions of a loss prevention engineer are comparable to that of a doctor, he seeks out the loss potentials, analyses the problems and prescribes a remedy. From there on it is up to the risk manager to decide, take the remedy or take the risk.