An Underwriters Worst Nightmare

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It is a normal day at the carpet finishing plant. In the early afternoon, heat-transfer oil begins to leak from a machine. The oil ignites on a hot spot. The fire spreads rapidly by fuelling itself on oil residues deposited on the machine, the floor and the buildings structure. The fire ignites oil residues at ceiling level and the flames spread above the sprinkler system. When the public fire department arrives, the north-east corner of the building is fully involved. The fire cannot be contained by the fire barrier walls. The plant is destroyed.
There is no spare capacity in the company or in the market. Because the plant manufactures a semi-finished product, several plants downstream have to stop production and shut down. The values of the buildings and the equipment as well as the business interruption values had been significantly underestimated.
The property damage and business interruption (BI) loss were settled at an amount exceeding by 400% the initial loss estimates for the facility. This type of catastrophic loss can hit any insurer any time.
The loss is aggravated when the actual loss largely exceeds the estimated one. It affects the insurers liquidity in the short term. In the long term, it dramatically impacts the insurers relation-ship with his treaty and facultative reinsurers, whose trust is shattered by the event. In times of hard market conditions, it can even lead to a price increase in the reinsurance treaty and a modification of its structure.

EML definition

The most recognized definition of EMLs is, as defined by the London Institute Insurance and Reinsurance Management Association (LIRMA), for determining property damage (PD) loss estimates. Unfortunately, LIRMA does not define a method to determine the BI portion of a loss. This may be because the BI loss determination depends on multiple factors, such as the time needed to rebuild or repair buildings and production equipment after a loss, the market price of commodities at the time of loss and the existence of interdependencies between factories belonging to the same insured. Other external factors like Casualties, salvage, pollution and contamination can greatly delay rebuilding operations and consequently increase the BI. And additional coverage like the customers/suppliers extension can add to the loss.
The EML is most often expressed as a percentage. It can be shown as a PD-EML, a BI or a combined PD and BI one. The 100% mark for property values is usually the sum insured for buildings and personal property, ie machinery, equipment and stock at the premises. The 100% mark for BI is generally the sum insured for a period of indemnity of 12 months. Therefore a 12-month BI would be equivalent to 100%, a six-month BI to 50%, an 18-month BI to 150%, etc. These definitions may change from one insurer to the other, but they are the most commonly accepted conventions.

Property value insured and sum insured

Dependence on sum insured concept in allocating capacity shows the first possibility of making an error. The reference point is the sum insured. Other costs are covered by an insurance policy and are not included in the sum insured, for example, the costs and fees for fire-fighting efforts and fire-fighting materials, the cost of clean-up and decontamination, expediting expenses, personal property of others, ie employees and third parties, damaged or destroyed during the event. These costs are most often additional to the sum insured and are sub-limited as a percentage of the total loss or as a monetary value. In case of small sums insured, these sub-limits can add up to a significant value compared to the sum insured.
The sum insured for a location may not necessarily be equivalent to the actual replacement value of its buildings and equipment. This discrepancy often appears when an appraisal has not been the basis of evaluation, but rather when the book value, residual value, the tax value or purchase value has been used. Applying index rates to update the values does not really help, because the price of industrial equipment does not follow the usual index rates. If the sum insured has not been updated to the replacement value (or value insured), the indemnification will be lower than the replacement cost, and

the insured will have to pay for the difference or more if an under insurance clause is included in the policy.

Business interruption values

The size of the BI loss depends on the duration of the plants shutdown. If this duration has not been properly estimated, the insured is in for a bad surprise. Casualties, pollution and contamination notably increase the duration of debris removal. Reconstruction can be very much delayed. Replacement equipment may not be readily available and the insured might have to wait several months before he receives new production ma-chines. This can be further complicated by the desire to upgrade rather than simply replace with like kind and quality.
If the insured has several factories that depend on each other for the supply of raw materials and semi-finished products, the BI may be increased with interdependency coverage. This coverage is automatically included in BI insurance. It will effect the insureds loss of profit, payments for salaries and wages as well as fixed costs.

Buildings and exterior exposures

The EML for free standing buildings is rather straightforward. The LIRMA definition indicates that the EML is the value of the building and its contents. Things become more complicated when firewalls subdivide the building into several fire complexes. If you refer to the Figure, you will notice that several firewalls with openings protected by fire doors subdivide both the production building and the warehouse. One could develop a loss scenario in which these walls prevent the fire from devastating the entire building. Only free standing, parapeted walls with-out any openings can be considered true firewalls that can prevent a fire from devastating a facility. Thus, under reasonably adverse conditions, at least one door will not close and the fire will extend beyond the calculated EML perimeter. The immediate consequence is that the EML is (blown away).
A common error is to over evaluate the properties of a separation wall. Most firewalls are provided with openings to allow the passage of vehicles and persons from one side to the other. These openings are generally equipped with special doors that shut automatically in case of a fire and are capable of resisting a fire for one hour or more. Even if there are blank walls or openings with double fire doors, there is still a risk that doors are locked open or (unauthorized) openings have been made for new electric cables or new process piping. A regular survey of the premises and a wall inspection should help to reduce this probability.

Changes in occupancy

The occupancy of a facility may change. Storage areas can be inserted into production buildings and vice versa. These changes modify the hazards in the buildings. The existing fire protection may not be designed to protect the new hazards.
The storage and therefore combustible load in the building may increase dramatically. A concentration of values may occur. New equipment may be installed in an idle building and a new production line with a higher total value started.
All these factors may result in a loss higher than the one expected, or in a greater loss in another building. Only a regular survey of the insureds factories may help detect changes in occupancy. After each survey, the changes in hazards and risk have to be evaluated and the EML updated accordingly.

Detachment between buildings

The EML determination is very much dependent on the separation between buildings. Calculation methods to determine the adequacy of detachment are proposed by all major insurers, reinsurers and in fire protection standards .
What is often overlooked, however, is the yard storage between buildings. It can reduce the separation to less than the minimum required. Especially if the storage is combustible, eg wood pallets, encapsulated finished products on pallets, trailers or tanks, the continuity of combustibles between two buildings may be given. In such cases, the initial EML of one building can be increased to a second or maybe third building.

Loss scenario

The loss scenario may have been developed for a building or group of buildings that no longer represent the highest value. This can be the case when divestments take place or when a smaller building contains more compact, higher-valued equipment. To avoid this type of error, a breakdown of values per building should be requested from the insured.
We saw in the example above that a loss scenario based on the building with the highest property damage potential, eg a warehouse, does not necessarily represent the highest combined PD and BI scenario, eg the production area. This type of error mostly occurs when an insured decides to buy BI coverage and the previous loss estimates for PD have not been updated. To avoid this, an underwriter should review the EML annually and every time he is informed of a major change in the factory.
Errors of judgement are not uncommon. The fire departments response is overestimated, or the underwriter assumes that automatic fire protection will reduce the loss. These errors are due to a misunderstanding of the EML definition, and can be avoided by respecting the principle of adverse conditions.
A common practice when determining the BI-EML is to limit it to the period of indemnity, eg 12 months. In such a case, the insurers surveyor generally indicates a 100% BI-EML. But it might take longer to rebuild a facility. For example, a plant is destroyed by a severe fire. It takes for example 15 months to rebuild it and to receive new equipment. The facility was insured with a 12-month period of indemnity. The survey report indicates a BI-EML of 100%. To consider the actual BI-EML, the proper percentage would have to be 15/12 which corresponds to 125%. It is preferable to estimate the actual duration of the BI by the surveyor, because it then gives the underwriter an exact picture of the risk. This is particularly important when the customer later wishes to increase the period of indemnity. For refineries, petrochemical plants and heavy hazard chemical plants, an unconfined vapor cloud explosion (UVCE) is the most accepted EML event in the insurance industry. This can only be calculated by using an algorithm. Further, it requires very precise data on the plants chemical processes, eg size of the largest vessel, the vessels maximum allowable pressure, vessel con-tents, process temperature, etc. The only way to obtain this data is to hire a chemical specialist surveyor to survey the location.

Problems arising from weak wordings or extensions of coverage

Nowadays brokers propose broad manuscript policy wordings that force the carrier to assume liability for risks otherwise excluded or not covered. For example, the insurer is required to replace the entire facility, even if it is only partially destroyed in a loss. This is the case with insureds who have old factories that cannot be repaired. If a loss occurs, the entire production equipment has to be replaced because the old parts would not be compatible with those replaced.
Another example for BI coverage is the inclusion of the customers/suppliers extension with a blanket sum insured for a blanket period of indemnity. This can be the source of a major disaster if the key suppliers are unknown and one of them suffers a large loss.

Conclusion

There are many ways to (blow an EML), but it is relatively easy to avoid it. Attention needs to be paid to details. EMLs have to be determined by professional and experienced risk surveyors, and they may not be reduced for commercial reasons by underwriters or account executives. An EML must be reviewed and revised if necessary at least once a year as well as every time a major modification to the account becomes known. During the renewal, a new EML should be determined before accepting a broadened policy wording.