THE ROLE OF THE INSURANCE INDUSTRY IN PROMOTING LOSS PREVENTION MEASURES

Arthur Spiegelman
Professional Engineer
Millburn, New Jersey

One advantage of being the last speaker on the program, the bugs have been worked out of the sound system and the taxis have all gone home with their noise. It is just you and me to talk this little problem over. I am going to try to give you an overview of the way the insurance industry looks at loss prevention.

A friend once taught me how to sell life insurance while I was going through college. He did something that I thought was interesting. He would take a dollar bill out and place it right on the table in front of the client, and he'd say, for every dollar you put up, I will put up a 500 dollar bill. If you die during the year, your family will collect the $500. If you don't, we are going to keep the dollar bill. It was something that you could see and understand. This is essentially what the insurance industry is doing. Insurance is taking a smaller amount of money, for the cost of a premium. They're saying that if you sustain a loss, we'll pay for it. So, it is a business of risk evaluation. It is a business of trying to determine how much of an exposure exists, and how do we determine an adequate pricing mechanism.

While the work that we do is humanistic in the sense that we are trying to prevent loss of life and property, we are doing it with an economic factor in mind. If we sustain heavy losses, we are going to pay, and we sustain a loss in the rating column at the end of the year. We're in business, like any other organization, to make money. So, we're attempting constantly to try to evaluate the technical aspects of all insurable risks. We have been doing this for a number of years. At the turn of the century, we developed the first Building Code in the United States, which was followed by others. We turned out the first Fire Prevention Code, First Electrical Code, we started (U.L.), we started the National Fire Prevention Association (NAPPA).

The insurance industry Underwriters Laboratories are well-grounded in the field. They have people serving on over 200 technical standards-making committees. In the American Insurance Association, my former organization, we had some 240 insurance companies that bought technical consulting services from us. As an organization, we were very much interested in the job that they were doing. It was our job to keep their 10,000 engineers on top of their jobs. I use the term engineer loosely as they are not all engineers. Some of them work in the field of industrial hygiene, some of them work in the field of nuclear fission and fire prevention. All of these people work together in an attempt to prevent losses of every type.

Industrial health has interested us for a long time. The insurance industry has 15 large laboratories presently operating in the United States, and over 200 people working in the field of industrial hygiene. You should recognize that we are doing that in spite of the fact that at the present time, the losses due to occupational health only constitute three percent of our worker's compensation claims. So, we are looking at this in the long-range view. We anticipate that it may increase; we hope that it doesn't.

Half of the three percent are problems associated with noise. This has been with us for many years. One and a half percent of the health problems are actually due to people being exposed to various chemicals. One of the problems with worker compensation, as we see it today, it is like insuring a time bomb. You feel that some day it will explode. We are faced with the problem of attempting to evaluate it, and we certainly have been trying to do our homework to find ways that we can evaluate the size of the health problem accurately.

Consider a person who goes to work in a plant today, and is exposed to some chemical. He may not observe the onset of his occupational sickness for 20 years or more. Insurance companies have been insuring that man at today's rates, and with the present rate of inflation, receiving premiums at today's dollars. However when he finally does come down with the disease, the insuror will be paying him at an inflated rate of 20 years from now. This brings a great many problems to our minds that insurors never had to face in the straight accident type of worker's compensation. If a person fell and broke his arm, you saw the damage immediately, and you put in the proper amount of reserve. You could cover it, and you could tell at the end of the year if you were losing money or making money. This is not true for long term occupational disease problems.

The mission of the insurance engineer is to determine whether the proposed risk is insurable, and in that sense, he examines the risk even before any insurance money is placed on the line. The second mission is to advise his management as to what conditions are acceptable and what was required for the insured to minimize his exposure. Now, in no way does the insurance engineer accept the responsibility of the insured for safety. In other words, because one of these people has entered the plant and gone into it and looked at it and spoken to the management, management still bears the entire responsibility for any mishap that occurs.

For many years, insurance companies were pretty much alone in the safety field. Industry wasn't too interested in what was happening; government was just taking a passing interest in it. Anything that we did develop was passed on to industry. We have had hundreds of meetings with industry people on this very subject.

A major part of the current development of control technology, is to be sure that you make use of the private sector's expertise in developing acceptable standards. Unfortunately, if you look at the experience of some of the federal agencies, when they attempted to take standards and enforce them as regulations and laws, they found out that standards were not made to be laws or regulations. Most of our technical engineering standards were developed to guide engineers in the field, to assist them in producing a product and in carrying on the same job safety. When they were made into mandatory standards, they found that they were far too exact for enforcement. In addition, it required highly sophisticated personnel to spend a very large amount of time in going through a plant to see if every screw was turned and every nut was in the right place. Basic concepts should be sought.

I would hope that in the future, when NIOSH goes into the control technology business, that they heed the American Institute of Chemical Engineering, which has recently started a safety and health division and is in a position to bring together all of the facets of the industry, the federal establishment, state government, insurance industry, and all of the people who are interested, in developing a safer working environment.

About ten years ago, the insurance industry looked at the chemical industry with a pretty jaundiced eye. We suddenly found that no matter what we did we lost money. The industry was practically becoming uninsurable. What was happening to this industry? Well, it was going through a great many technological changes and loss control personnel were unable to maintain the pace.

First, the industry was moving ahead, into the single train plants, so that if you had four, five small lines producing a chemical, they were all combined into one large single train. The result was that when you developed a leak, it was a catastrophe. What we also had to insure was the continuity of their business. We found out that they couldn't replace huge compressors. When we tried to check the fires, we found that the fires were too large to be controlled by ordinary equipment. When a leak developed and a huge cloud of a flammable liquid came out as a vapor cloud, we simply did not have the technology to control it. Some tremendous losses have occurred over the last 20 years.

At the same time, the insurance industry was developing a new type of policy, something like your homeowners' policy, - "a multiple risk" insurance policy. In 1969, we had a premium of $20,000,000 in this type of insurance. Last year, we sold $4,000,000,000 of this type of insurance. This signaled the development of group engineering which covered all of the risks.

With this change in the offing, we decided to look at the chemical industry and find out what we could about it. We turned out a survey report ten years ago. It was a survey of the chemical and allied industries. This year, we came out with the second revision of this

book. After looking over about 3000 large losses ten years ago, we found out that these losses fell into nine major groups that we could relate the hazard factors to.

Hazard Factor	Number of times Assigned	Percentage of Total
(1) Plant Site Problems	16	3.5%
(2) Inadequate Plant Layout and Spacing	9	2.0%
(3) Structures Not in Conformity with use requirements	14	3.0%
(4) Inadequate Material Evaluation	93	20.2%
(5) Chemical Process Problems	49	10.6%
(6) Material Movement Problems	20	4.4%
(7) Operational Failures	79	17.2%
(8) Equipment Failures	143	31.1%
(9) Ineffective Loss Prevention Program	37	8.0%
Total	460	100%

Plant problems, was the site adequately investigated? Was there an adequate plant layout and spacing between equipment? Was the structure in conformity with use requirements and the chemical adequately evaluated? Was the chemical process hazard problem adequately considered? Was material evaluation during the unit operations properly considered? Were there operational failures and equipment failures? And finally, Ineffective Loss Prevention Programs exist essentially where top management isn't paying enough attention.

Ten years ago, most of our losses were in the fields of fire and explosions. Now, we have a number of boiler and machinery problems, an item that we didn't adequately cover in the 1960's. But, in 1968, very few were talking about the problem of occupational health. Inadequate site accounted for 3 1/2% of our losses, improper plant layout accounted for about 3 1/2% and improper procedures 1 and 1/2%. Material evaluation, which in 1968 was about 20%, has come down to about 10%-11%. Improper process evaluation, which remained pretty much at about 10-12%. Now, unit operation went from 4.4% to 13%. Operating failures from 17% to 28%, and equipment failure still was the major component. It went from 31% to 29%.

These facts are interesting to us, because from an underwriting standpoint, for many years we were underwriting on the basis of the nature of the material and very little else. The material was evaluated, to determine if it was toxic, explosive, flammable or was it corrosive

causing some damage. One of the things that we did notice in this survey is that we were finding a tremendous number of explosions reported, see Table below.

Study of the 317 case histories with regard to placing them in categories of (1) fires, (2) explosions, or (3) both fires and explosions, reveals the following:

(1)	Fires (only)	122	38.5%
(2)	Explosions (only)	111	35.0%
(3)	Fires and Explosions	74	26.5%

Now, while we have about 18 volumes of standards for fire hazards, and we have many standards and criteria for chemicals, we have practically nothing written on explosion on methods of anticipating explosions, and methods of evaluating the amount of damage that will occur when we do have an explosion. Let's just go through these hazard factors. I would like to show you how they apply to the health problem as we consider it.

The Plant Site Problem. Poor location with respect to adequate water supply; unreliable emergency units; traffic problems for the emergency equipment, also, exposure to the public from the standpoint of pollution with the site of the plant too close to it; inadequate plant layout and spacing. Here, we ran into the problem of being unable to do proper inspection and maintenance, exposure of high value equipment that was very difficult to replace, lack of proper emergency equipment facilities in the event of an emergency. If you have a process that contains a very hazardous and toxic chemical, and it is located right next to some potentially explosive process, one explosion will open up the other tank, and you wind up with real problems.

Structures not in conformity with use requirements. The fact that you do put a plant into a building increases your exposure of your people who work in the plant. It also increases the explosion potential. The physical structure may not be in conformity to use, and we do find a great many plants are transformed from one type of chemical process into another. Too often, the major factor is that the plant and building is available at a site, that it is useful. The owner of the plant will therefore use it for that purpose despite the fact that the plant will not serve as a good building from the standpoint of explosion resistance.

Not too long ago, 47 people were very badly hurt in a factory in Long Island City. Some of these people died and 35 of them were severely burned. Material evaluation is probably one of the major things that we are concerned with. Insufficient evaluation from the health aspect has been with us for many years. NIOSH has a list of 2400 suspected carcinogens and is presently regulating 15 or 16 of them. We need to work to bring together the information to conduct an intelligent evaluation of the problems.

Much of the evaluation of fire hazards has been done over the years; very little on the health aspect. We need a great more on the explosion aspect of hazards. Some of the information that is required when one of our engineers goes into a plant is not just the name of the chemical, but we want to find out where the commerical grade chemical is, and what contamination factors exist when a quantity of the material is released. These are some of the basic things we are trying to find out. We also want to know what are the end products. We run into a great many problems. There is a lack of information on many of the processes, mainly because almost every single company considers its process a proprietary sort of information.

Over the last few years, many companies have started sharing this information. When you hire a man from company to company, he takes along a lot of that information with him. When a plant blew up in Tonawanda, New York in 1955, we were rather surprised when we went to investigate that explosion - we found out that many of the people who used the product had little knowledge as to the nature of the materials they were handling.

One of the things that concerns us is the operation and physical transformation of chemicals. Just naming chemicals and saying, we will rate this chemical with regard to toxicity or saying this is a hazardous item in itself is to miss the point. When changes in the physical form of the chemical occurs, such as venting it off as a fine mist, that chemical is no longer the same as it was originally. Fine powders are much more easily absorbed into the body, brought into the lungs and absorbed through the skin's pores. One of the things that has to be spelled out when we're talking about evaluation of the risk, is the nature of the material that we are handling. Not just the name of the chemical, how it is being handled and at what temperture? If a leak develops, is it possible for that material to form a gas or vapor, or will it remain in liquid form?

One of the items that I can see coming up for review is operational practices and training. As our technology changes, too often we don't change the training of the operators to keep pace with the technology. We find that a lack of detailed information on what is changing puts the operators in the dark. Subsequently, if an emergency develops, it can result in inadequate handling of the emergency. We would like to see a good operating manual that has a description of the equipment, of the process, the material properties, the start up and shut down procedures, normal operating procedures, and safety considerations. We would like to see what precautions to take. These are some of the items that should be every day knowledge, and all of these things together affect the safety of the operation.

Equipment failures are one of our biggest problems because the hazards are built into the design of the equipment. It has taken us a long time to get the "safety and health division" put up on a division level, so that we are on an equal footing with the equipment division and the design division in the American Institute of Chemical Engineers.

I remember when I first worked on this technical survey, I went to a number of larger consulting engineering concerns, and asked them, what standards they were using for various types of equipment? They showed me volumes that looked like the Manhattan telephone book. This is the design standard for one company, and no two companies used the same design standards for equipment. They had spent a lot of money to make that process work, they weren't about to give it away for nothing.

I think we have almost come to a point now where we have to share some of this knowledge. Otherwise, we are going to have some governmental agency come up and dictate to us that certain factors have to be in the equipment. I think it is about time that we recognize that we can afford to share safety knowledge with one another.

These are some of the considerations that should go into design of the equipment; the reliability of the unit, ease of operation, flexibility, provisions for the future, adequate emergency shutdown facilities, standardization. All of these things are essential. It might be interesting to note that in pollution control, we are not only interested in seeing that the operator of a particular tank of toxic chemicals has some means of warning that there is a leak in the tank, but we also desire air automatic shut down and alarm device. This is something which is still to come in many of our loss prevention surveys. If loss prevention comes as an afterthought, and I am talking about every kind of loss; fire, explosion, health, worker exposure, economic, pollution control and general liability, any of these losses, it will be more expensive and more of a job to sell to the top management of your companies.

If loss control is worked into the economics of the project, if it is shown that by running a safer plant, you're also running a plant that is economically sounder, than top management will look upon this with a much greater appetite. You can see, just from these items that we have detailed, that it is possible to conduct a lecture on parts of each of the subjects. After working in the business for 30 years, and working in the laboratory for ten years as a chemist, I saw many things that eventually drew me into the safety field. It is more important today than any other time in our history, as we have greater opportunities for achievement. Now, if I may wind up with just a few more thoughts that I scribbled while I was sitting here today, there are no such methods for anybody to prescribe a loss control technology that will guarantee loss-free or a risk-free industry. The total loss control concept which I just discussed here, is just one approach to the project. The reason that we're approaching it this way is that we feel that in too many instances, people think they can only control losses by laboratory testing of materials and "total loss control" is necessary. You have to touch all the bases if you want to hit a home run in this ball park.

One of the hardest problems that we have to face as a society today, is to determine what is an "acceptable" risk. In no way can you have a completely risk-free society. It is one of the problems that is being

faced by regulators. How far shall we go? One part per billion? How safe do we actually want industry to be? The insurance industry is constantly facing this problem. It puts money on the line to support its opinions. We feel that you should strive to be as safe as you can. However, that must be much safer than you are today. Unfortunately with some of the things that have come up in recent years, such as cancer, or suspected materials that produce cancer, the public wants to be entirely rid of them. We don't know enough about the subject to really guarantee that whatever we're doing in the field, we can completely rid the public of this entire problem. However we do know that we can improve on what we're doing, and so we should encourage all the people who are working in this direction to try to achieve an acceptable risk, one which we and society, through meetings like this can agree on.

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DISCUSSION:

MR. D. G. IRWIN: You said that of the worker compensation cases, some were chemical, some were noise and that the chemical part was a time bomb with more claims in the future. Can you give us some example of settlements that have had to be given recently to workers due to chemical exposures?

MR. SPIEGELMAN: I don't have a list of those claims, but there is hardly a day that I can pick up the paper and see where workers in some plants have discovered that they have become sterile. Workers in one plant right near my home in New Jersey, recently went on strike. One of the major reasons was the health problem that they were experiencing at the plant. From our standpoint, the very fact that the insurance industry would set up 15 different laboratories and employ 200 people in those laboratories for hygiene purposes should give you some idea that we have become aware of the fact that if you work in a plant with a chemical, you don't die all at once, but die a little bit every day from that type of exposure. Therefore, it is hard to pick any particular moment when you should put your claim in. Sometimes it is at the end of a life. When doctors perform an autopsy and find out that the liver isn't there anymore, it is too late. I think we have come to a point where intellegent people are looking at this. We have lawyers looking at it as well as chemical engineers and chemists who see that there is a serious problem in the future.

MR. JOHN T. BARR: This is more of a comment than a question. The industry is perfectly aware that insurance companies are pretty much in agreement with the regulatory agencies. There is no limit to the money that our industry has spent to reduce our risks. We are here by mutual consent. So the record need not go uncorrected as to a misapprehension that has been expressed here today, the NIOSH list of some 2,750

suspected carcinogens. Flatly, there has not been a list of suspected carcinogens, but materials which will be investigated to see if they could be carcinogens. This is what it says in the preface of the book. Now, OSHA hired people to write carcinogen standards. They hired them to go through that list of carcinogens, suspected, possible carcinogens to see how many of them would be classified as carcinogens. Something like 85 turned up. There is another laboratory study in addition, and they have come up with a different number of different ones which shows the confusion, but their number is something less than 300. That is something different than 2750. Three hundred is enough. Let's don't exaggerate the problem.

MR. SPIEGELMAN: Before you accuse people of exaggerating, I think you ought to be accurate as to what I said. I said there were 2450 on the list, the NIOSH suspected list and we're presently regulating 15 of them. Even taking your figure of 85, that would be 15 out of 85 and I think we ought to be concerned about the other 70 of them that are not being regulated as to our writing insurance for the people exposed to them.

MR. BARR: The point I want to make is we should do the things which we do with a sense of perspective so that we understand the actual problem. We understand what we have available to us; we understand where we are going. We are doing it in the light of the best numbers that we have available.

NIOSH

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