Bowring

AEAI/RIMS - 1991

GLOBAL LOSS CONTROL STANDARDS

ENVIRONMENTAL RISKS

by A.J. HICKS

Deputy Chief Executive

Bowring London Ltd.

October 1991

For simplicity, ease of operation and administration a combination of fundamental standards and quality standards is probably the most effective way to address global environmental loss control.

To finish I would like to try and pull the three presentations together and raise an issue which I feel is important to the global company. We have talked this afternoon about property loss prevention, safety and environmental risk management as though they were three totally separate subjects. Well, they are not - although very often responsibility for each discipline is split between various individuals/departments in an organisation.

From the corporate managers' viewpoint he would like to see risk expressed in a consistent and easily understandable way. He can then decide where his concerns and priorities lie - if he has $1 he can readily see where he should spend that $1.

It make tremendous sense to represent risk assessments, audits or whatever they are called in a uniform manner. There's a lot of science and engineering involved in each of the subjects, but clear and consistent presentations sure makes decisions a "hell of a lot easier".

The foregoing general standards can form the basis of fundamental global standards, but they must allow for local interpretation or modification to cater for specific local exposures. By defining and adhering to these fundamental corporate standards you should have a well designed, constructed, operated and maintained plant.

Quality Criteria

The alternative or supplementary idea is that of quality criteria - which again can be split into two different approaches:-

* Quality Standards: where the quality or limiting contamination of a particular stream or emission is defined e.g. 50 ppm of sulphur dioxide in stack gases or 25 ppm heavy metals in effluent streams. These standards are set by the corporation and would be more rigorous than regulatory limits. Performance is continuously (frequently) measured against the standards and operation modified to ensure the standard is always met.

* Quality Objectives: a more complex approach whereby the aim of the corporation is not to materially affect the quality of the local environment. In this case there would not be a specific standard set on the quality of an effluent stream or emission, but the limiting value would be judged on the existing contamination of the surrounding air as water. In this case the same, identical factory in different locations would have the same quality objectives, but differing permissible emissions.

Fundamental Standards

This is my term for general physical and procedural good practice which addresses the construction and operation, normal or otherwise, of an industrial facility. Some examples of fundamental standards are as follows:-

* Location/Installation: where it is located (there may be a choice at design), the physical standards and codes used in construction, the materials of construction, the plant layout and proximities, drainage etc.

* Physical Protections: containment philosophy and hardware, instrumentation, protection systems including fire and explosion, spill containment.

* Operating Procedures: procedures to ensure the plant is operated safely within its design criteria (except when testing alarms, trips etc.), that equipment is not overstressed, start-up/shutdown procedures etc.

* Maintenance Programmes: maintenance schedules, frequency, preventive/repair, plant history records, isolation procedures, vessel entry etc.

* Emergency Plans: major incident response - by assessed risk e.g. fire, explosion, flood, hurricane, earthquake, spill response and clean up, etc.

However, the very same plant in a built-up environment would perhaps require more stringent controls.

The flexibility and local consideration given by adopting an assessed-risk basis for corporate protection is highly desirable.

Whatever standards are adopted, centrally and locally, require regular auditing of performance and monitoring to ensure any recommendations made are implemented.

In summary, this is what I believe you need to make a global loss control programme work:-

* a sound corporate philosophy emanating from the CEO and board.

* derivation of corporate standards based on the assessed risk, but permitting deviation for sound local reasons.

* regular, external audit of performance and monitoring of improvements.

GLOBAL LOSS CONTROL CRITERIA

If we look more towards the criteria against which performance is judged or benchmarks for protection standards there are two main approaches - which are not mutually exclusive.

* Solid absorption and transport
* Volatilization
* Bioconcentration
* Biological, chemical and photochemical degradation in various media.

GLOBAL ENVIRONMENTAL LOSS CONTROL

For corporate survival it is imperative that businesses develop a sound approach to each of the aforementioned environmental issues. Similar to property and safety loss control the essential ingredient is that it is driven from the top - a sound corporate philosophy that is propagated throughout the corporation from the board downwards.

Exactly how this is done and to what extent it is a truly "global" programme will depend on the management structure and style of the organisation. The programme must suit the organisation - whether it be totally centralised or totally decentralised. A programme incompatible with the structure will fail. This is true for any loss control programme.

In concert with my earlier comments on the impact of surroundings or locality on the specific risk present at any one location, I believe assessment of risk plays a fundamental part in determining the application of the corporate loss control standards.

There is no point imposing very tough and costly standards of protection at a facility where loss of containment or an atmospheric emission would create no risk because there is no population likely to be exposed.

Waste Management - The disposal of hazardous and toxic wastes have become a major environmental issue globally. Much waste is still disposed to land. High temperature incineration has had a chequered history - and since been stopped at sea.

Contaminated Land - The phenomenon of recycled land is common in Europe, where much industrial land was used for prior industrial purposes. The need for acquisition and disposal audits is emphasised. Also within this category is landfill gas and radon.

Noise - An employee and third party exposure, subject to controlling regulation.

Major Accident Hazards - Following the Seveso Incident, the "Seveso Directive" places onerous requirements on the operators of so termed Major Accident Hazard sites, determined by inventory of hazardous material..

Environmental Fate and Transport - The importance of environmental fate and transport is often underestimated in determining environmental exposure and risk. It is quite possible that a highly toxic, readily degradable substance will cause less environmental damage than a less toxic but persistent chemical. For example, bis (chloromethyl) ether is a potent carcinogen but quickly hydrolyses in contact with water to produce inocuous products. Evaluation of how a chemical will behave in the environment depends on a number of factors including:

* Physical-chemical properties (water solubility, vapour pressure, octanol-water partition coefficient).

Air Quality - Air quality concerns differ from one country to another. Main concerns are acid rain and the emission of toxic substances from chemical use and storage. Some European countries have specific permit requirements for all emission sources. The targeted contaminants have generally been sulphur dioxide, nitrogen oxides, hydrocarbons, oxidants, carbon monoxide and particulates. In the wake of the Bhopal incident and others involving the release of toxic chemicals into the air, concern is rising regarding the emissions of specific toxic pollutants.

Occupational Hygiene (Industrial Hygiene) is the exposure of workers to workplace contaminants which is now increasingly regulated. Perhaps this should be regarded more as an employee safety than strictly environmental issue. This area would also include asbestos programmes, legionella pneumophila studies etc.

Groundwater - Contamination of groundwater has become one of the most important environmental concerns. The inaccessibility and persistence of pollutants in groundwater make detection and clean up very difficult. An underground leak can continue unnoticed for years, leaving a pool of contaminants that is slow to disperse. The threat of leaking underground storage tanks is also an area of recent concern and the impact of such contamination is just being realized in Europe.

Surface Water - The pollution of surface water usually occurs from sewage discharges, although contaminated groundwater can also seep into rivers and lakes. While pollutants disperse more rapidly in surface water than in groundwater, exposure to fish and wildlife usually occurs through the surface water route. Surface discharges have been largely cleaned up in the last decade, yet an accidental spill of toxic pollutants can lead to costly fines and a poor public image.

* **Negative Land Value** - the cost of remediating the ground contamination on a site you wish to sell (or have just bought) is greater than the land value itself.

* **Clean-up Costs** - either on-site or off-site clean up of land or water (ground water) can be very expensive.

The above examples are all potentially damaging and largely uninsurable (currently), and arise from the generality of environmental risk.

ENVIRONMENTAL ISSUES

If we look at the environmental issues you can see the nature of the risks is very different to those risks already considered this afternoon. Property loss prevention and safety are, in many ways, independent of country or location - regulation may differ, water supplies may differ, but the underlying risk will be identical for identical factories. This is not true for environmental risks. Environmental risks, by definition, relate to the location and surroundings. If you like, property and safety loss control are geared to things happening within a site or factory, whereas environmental risk management focusses on containment or controlling what leaves factory or site, intentionally or otherwise.

Therefore any corporate environmental standards should take into account the surroundings of specific locations - or risk being too tough, too lenient or inapplicable. Let's review the main characteristics of the environmental issues:-

INTRODUCTION

Managing environmental risks in one of the most complex tasks facing managers in industry today. Not only do they have to grapple with the physical, scientific and engineering aspects of risk but they must deal sensitively with an increasingly intolerant public.

The environmental arena has witnessed a plethora of regulation over the past ten or so years. If we consider the European Community I believe something in excess of 300 pieces of legislation have been processed in that time - spanning from the sulphur content of gas oils, to CFC manufacture, to the quality of bathing water. Quite a mixture.

Regulation is perhaps one of the driving forces for structuring a management response to environmental risks. However, perhaps more so than in the other two areas of loss control already considered (property and safety) the financial downside, both direct and indirect, is the major motivation. Consider the following examples:-

* **Loss of Production** - following shutdown of a factory, possibly statutory closure, because of unacceptable emmissions. For continuous process plant you can imagine the loss of earnings.

* **Loss of Sales** - resulting from a public not prepared to buy your products as you have been deemed "environmentally irresponsible" following some incident in a third world country. The green consumer wealds increasing power.