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Incident Investigations – Lessons Learned – Development and Communications

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36.1
Introduction

Organizations that do not learn from their mistakes are destined to have repeat failures. Additionally, organizations can learn from the incidents of others through industry and discipline channels of communication. For these reasons, it is helpful to have processes that offer ways to communicate with all relevant stakeholders as issues arise as well as a preventative measure. Since the point of incident investigations is to learn from failure (Dekker, 2002) and prevent recurrence, it makes sense to have a process that allows communication in a way that achieves maximum benefit from investigation efforts.

Managing information well both from within and from outside an organization results in competitive advantage (Wellman, 2007) but can be a challenge from time and resource perspectives. Unfortunately, many organizations do not collect and distribute lessons learned (Hedge and Pulakos, 2002).

The lessons learned process should be developed and thought of as a ''system'' where the components of the system (Kjellen, 2000) include reporting and collection, storage, information processing, and distribution. All of these components working together can function as a prevention system for future incidents.

36.2
Internal Lessons

How an organization communicates internally can be a determining factor in prevention of future incidents. For example, an organization that has plants around the world and has an incident should have a process to ensure that other facilities do not have the same problems present.

Compiling lessons learned is a process of knowledge management; a method of collection and storage has to be applied and the information shared with relevant stakeholders. The data can be kept in a lessons learned database (Tirpak, 2005); however, this requires diligent validation and updating to keep records accurate.

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The complexity of the lessons learned process is dictated by the organization size, industry, and operating environment. For small organizations, the process may be relatively simple, whereas larger ones may need substantial infrastructure, such as the United States Army's Center for Army Lessons Learned (Holder and Fitzgerald, 1997), which compiles and disseminates data on a full-time basis. Since this organization is so large, lessons learned are placed on the Internet for access by those seeking the information.

36.3 Distribution

In smaller organizations, face-to-face communication may be possible; however, in larger companies with multiple facilities, it may be necessary to use postings or ''read and sign'' methods to disseminate information. For extremely important or regulatory issues, organizations may have an electronic method of communication where they can track who has acknowledged receipt of the information.

When using written communication to disseminate information, the communication should be concise and be professionally prepared to grab and hold the attention of the reader. The impact to the organization in terms of human suffering, cost, lost production, and the like can be useful pieces of information to stress the importance of the communication to personnel. In instances where the outcome of the incident was not severe but could have been, it might be useful to state that in the communication. It should be noted that multiple forms of feedback mechanisms (Conger, Lawler, and Spreitzer, 1999) might be needed in some circumstances.

''Lessons learned'' documents can be used as postings where large groups of employees need to be reached, and as talking points for supervisors and managers for face-to-face communication. These documents can serve two purposes (National Safety Council, 1994): raising awareness of safety at a high level, and giving employees and supervisors specific ways to reduce incidents. It should be noted that it may be necessary to prepare more than one communication for a given issue as different employee groups have different information needs (CCPS, 1992). An example of a basic lessons learned communication document is presented in Figure 36.1.

At the corporate or business unit level, incorporation of lessons learned into training material, policy, or procedure may be desired. If training is modified, both initial (new hire) training and recurrent training for existing employees need to be considered.

Closed-loop systems where proof that individual employees were notified of issues is required (such as a regulatory requirement) can be administered through a read and sign method or through an automated process. An automated process can be as simple as email notification with read receipt, or something more robust such as a tracking system where employees must physically acknowledge the communication.

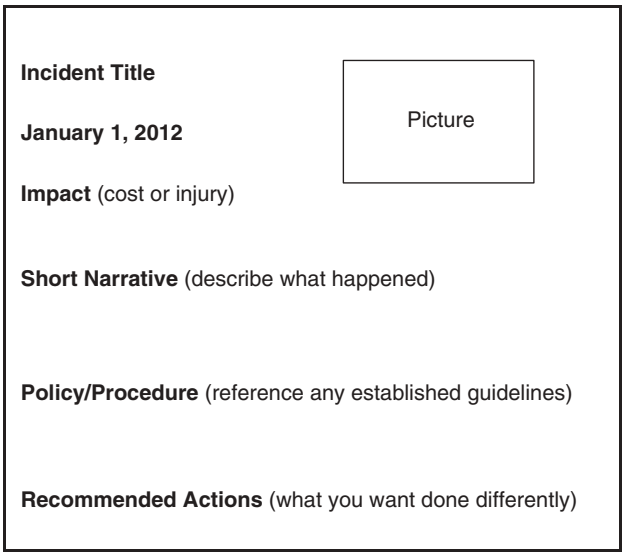

Figure 36.1 Incident report example – communication of lessons learned.

36.4 External Lessons

Although lessons learned and disseminated internally are a good way for organizations to communicate, they can also share lessons with their industry and discipline (Environment, Health, and Safety, for example) peers. Likewise, organizations should have a process designed to gather knowledge from the mistakes of others (inside or outside their organization) to help them improve.

36.5 Collection of Data

The collection of internal data for dissemination outside the organization would be accomplished in the same manner as it would for internal lessons learned. Gathering information from outside the organization, however, involves industry or discipline participation in industry or discipline groups and structured review of publications. In some cases, benchmarking may be a valuable exercise; however, it should be noted that benchmarking must result in a defined action plan (Stranks, 2005) with specific measurable improvement goals.

Easy monitoring of industry-specific or discipline lessons learned, current events, and regulatory changes can be accomplished through subscription services and online search tools. Many search engines will allow automatic retrieval based on keywords and send the information directly to the email addresses of those wanting the information. For example, a keyword search for ''fall protection'' can

be programmed so that any articles published on the topic can be obtained with no day-to-day monitoring effort required.

36.6 Dissemination of Data

Dissemination involves both internal distribution for information gathered from external sources and taking valuable internal information for distribution to the industry and stakeholder community at large. Distributing data to the organization would be accomplished through similar methods as internal data; however, since the lessons learned do not involve company-specific issues, some creativity in how to package and market the information is in order. One additional step, however, is taking the information from external sources and deciding on whether internal processes such as policy, procedure, and training need to be modified. This consideration should be built into the process.

36.7 Industry and Discipline Participation

Many companies choose not to participate in industry or discipline groups, citing manpower, membership, and travel expense; however, other organizations feel that the effort and expense are worthwhile. In addition to the personal development that occurs as part of these activities, safety personnel can bring back valuable lessons learned from discipline conferences, for example, and share the information internally to provide potential improvement opportunities. This type of endeavor has proven valuable in the author's experience.

Participation in industry committees provides an avenue to share resources and knowledge with other companies to develop industry best practices that benefit everyone. Examples of this type of partnership (Hofmann and Tetrick, 2003) in the United Kingdom include the Trades Union Congress and the Confederation of British Industry.

A concern in this area is the sharing of organizational best practices, and in some cases metrics, with competitors. The decision on what to disclose and the participation level are something that senior management and possibly the legal department should approve.

Since industry and discipline groups may not meet in person more than a few times per year, technology can be employed. Videoconferencing, document management systems, web-based project rooms, electronic meeting systems, workflow management systems, collaboration products suites, and application sharing are some examples of the technology available (Munkvold, 2003) to aid collaborative efforts. It should be noted that shared information can be useful not only to loss prevention engineers/professionals, but also policy makers, emergency and

business continuity planners, training entities, and general management (Jenvald, Morin, and Kincaid, 2001).

36.8
Regulatory Actions and Changes

It makes a great deal of sense for organizations to have a process to monitor both regulatory action in their industry and any proposed regulatory changes. In some countries the regulator may have a web site that will allow for this to be done very easily, for example, the news pages of the United States Occupational Safety and Health Administration (OSHA) web site. In others, the news can be monitored for regulatory action taking place. Again, industry contacts through committee participation may prove valuable in this regard.

It should be noted that in some cases regulators may participate in industry initiatives and make attempts to communicate with stakeholders about regulatory changes in addition to implementing performance improvement partnerships; examples of this (Gunningham and Johnstone, 1999) include the United Kingdom's Health and Safety Executive (HSE) providing postings and seminars and launching publicity campaigns; Worksafe Australia launching industry action groups; and in the United States, OSHA's Cooperative Programs such as the Voluntary Protection Program (VPP), Challenge Program, Alliance Program, Strategic Partnership Program, and Safety and Health Achievement Program (SHARP).

36.9
Suppliers

Suppliers are an important part of any company's business, and should in fact be part of the management system (Stankard, 2002); therefore, steps should be taken to ensure that lessons learned are distributed to them for mutual benefit. An easy way to do this is to include them in internal lessons learned processes. Working groups inside the company (safety committees, for example) may include suppliers to keep communication lines open. Results of supplier audits and also incident reports should be disseminated to those within the organization that are stakeholders in supplier performance.

36.10
In Review

Organizations that make maximum use of lessons learned through investigations, both internal and external, will be better able to manage their risk than those that do not, in the author's experience. Cost savings and improved overall safety are the by-products of a carefully planned and executed method for collecting and

disseminating lessons learned. The following case study illustrates how entire industries can be transformed through lessons learned.

36.11
Case Study – Lessons Learned

Most professionals working in safety and health or loss prevention engineering are familiar with the environmental health disaster that took place in Bhopal, India, on 2 December 1984, when a leak of methyl isocyanate killed over 4000 people; the human suffering, cost, and preventability of the incident are well known.

Multiple failures took place, resulting in the event; it is not the intent of this case study to revisit these failures, but rather present discussion around how lessons learned from these unfortunate circumstances changed business processes throughout the world. While the changes made from lessons learned were very reactive in nature, they nonetheless improved performance on a wide scale.

While the accident in Bhopal involved Union Carbide and its subsidiary in India, the failures and lessons learned reverberated around the entire chemical industry and prompted a re-examination of industrial policy and the chemical industry's relationship with society (Jasanoff, 1994) in general. Companies that were not involved but could see the potential for improvement (or potential for a similar event) in their firms embarked on a journey to improve performance by working together and pooling their shared knowledge.

The most important development (Hood, 2004) as a result of the disaster (and other smaller scale but serious accidents) was widespread industry acceptance of the concept of process safety management (PSM). Although the concept was not new, Bhopal and other accidents underpinned the fact that industry practices must change. Also, although PSM eventually resulted in substantial regulatory burdens for organizations to maneuver, large companies began to realize that complying with the regulations and working to go beyond mere compliance actually saved the company money (Camm *et al.*, 2001) and protected the organization from litigation and further harm.

Formalization of PSM in the United States began to occur in 1985 with the creation of the Center for Chemical Process Safety (CCPS) by the American Institute of Chemical Engineers. Prior to that, the European Commission's 1982 Seveso Directive was in place, and subsequently the 1992 UK Safety Case Regulations were enacted. Although process safety initiatives and much of the resulting regulation were born in the United States and Europe, PSM concepts are now employed to varying degrees all over the world. From a business perspective, multinational corporations can ill afford to have different operating standards in different countries.

Beyond changes in the way in which operations are conducted, PSM launched a new era of regulation in the United States. Regulatory oversight of PSM was codified into law in 1990 (Hood, 2004) with the passing of the Clean Air Act Amendments, which gave oversight authority to both the OSHA and the Environmental Protection Agency (EPA). OSHA was directed to create and enforce the PSM standard Process

Safety Management of Highly Hazardous Chemicals (29 CFR 1910.119), and the EPA was directed to create a risk management program rule (40 CFR 68), entitled the Chemical Accident Prevention Provisions.

Key provisions of 40 CFR 68 (EPA, 2009) include hazard assessment, prevention programs, and emergency response; 29 CFR 1910.119 is broader in scope, and was required by the Clean Air Act Amendments (OSHA, 2000) to include the following (abbreviated):

1) Develop written safety information identifying workplace chemical and process hazards.
2) Perform a workplace hazard assessment.
3) Consult with employees on hazard assessments/accident prevention plans.
4) Establish a system to respond to the workplace hazard assessment findings.
5) Review periodically the workplace hazard assessment and response system.
6) Develop and implement written operating procedures for chemical processes.
7) Provide written safety and operating information for employees.
8) Ensure that contractors are provided with appropriate information and training.
9) Train and educate employees and contractors in emergency response.
10) Establish a quality assurance program.
11) Establish maintenance systems for critical process-related equipment.
12) Conduct pre-startup safety reviews of all newly installed or modified equipment.
13) Establish and implement written procedures for managing change.
14) Investigate every incident that results in or could have resulted in a major accident.

Another major development resulting from the Clean Air Act Amendments was the establishment of the Chemical Safety Board (CSB) to investigate chemical accidents; operation of the agency began in 1998. Although the CSB operates independently, it also collaborates in important ways with the EPA, OSHA, and other agencies (CSB, 2011). The Board has entered into a number of memorandums of understanding that define the terms of collaboration.

This case study is intended to illustrate what can happen when professionals and regulators work together and share lessons learned to solve problems; however, it is not intended to portray a now perfect situation. Incidents such as the BP Texas City accident (an explosion which killed 15 people) in the United States and the Buncefield accident (an explosion) in the United Kingdom, both in 2005, underscore the fact that there is always more work to do, and always more lessons that can be learned.

As a result of the BP incident and several others in the United States, in 2007 the OSHA implemented a focus program for refineries (OSHA, 2007), because ''Since the PSM standard was promulgated by OSHA in 1992, no other industry sector has had as many fatal or catastrophic incidents related to the release of highly hazardous chemicals as the petroleum refining industry.'' And although most would not question that PSM has improved safety overall, CSB investigations since the advent

of PSM indicate that many of the systemic issues present at Bhopal remain the underlying causes of many of the more recent events (Joseph, Kaszniak, and Long, 2005). Whereas the OSHA focus program in the United States has focused on enforcement, chemical industry professionals and regulators have been working together in Europe (Milmo, 2010) to improve the regulations by incorporating best practices. It should be noted that processes, design of systems, and technology have advanced quickly since the advent of PSM (Knegtering and Pasman, 2009), which presents challenges for the industry and underscores the need for effective coordination between all those involved and a continuous improvement mindset.

Although this is a book for loss prevention engineers/professionals, it is helpful to note that the Bhopal accident not only resulted in lessons learned that changed operational safety processes, but organizations also learned serious lessons about disaster response from organizational, public relations, and legal standpoints. In this regard, Union Carbide's public response was less than effective; for example, they claimed that processes were exactly the same at Bhopal (Bhargava, 1986) and their plant in Institute, West Virginia, but then within hours also claimed that such an accident could not happen at Institute, a clear contradiction. Ethics become a discussion point at this juncture, because investigation results showed that Union Carbide employed different ethics related to safety rules (Robertson and Fadil, 1998) and how they were applied in the two countries. In this case, faults in the safety program overlap with faults in the corporate ethics program. Some claim that for weeks, Union Carbide held back important information (Shrivastava, 1985) not only from the press, but also from medical workers and relief agencies that were there to assist.

In addition, this disaster and others led to changes in both risk management and insurance (Aldred, 2004) concepts in the chemical industry. Emergency planning has also changed a great deal; before Bhopal, contingency planning was focused inside the walls of the plant (Sissell, 2004), but Bhopal showed that accidents do not observe plant boundaries.

Certainly, lessons learned can be applied on a much smaller scale than is presented here. The case study illustrates that large-scale improvements take a great deal of time, sometimes many years, and at times more work needs to be done to prevent backsliding. It is also important to note that without industry participation, such an endeavor could not be accomplished successfully. In the author's opinion, it is unlikely that pure regulation such as the United States' PSM regulations and other countries' process safety regulations could have resulted in such sweeping change.

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