THE SAFETY PROFESSIONAL'S ROLE IN Corrective Action MANAGEMENT

By C. KEITH STALNAKER

Many safety professionals participate in injury evaluations, property damage reviews and incident investigations. Other typical assignments include chairing or being a member of investigating committees that identify root causes of incidents and recommend corrective actions. Results of these activities influence management decisions, affect budgets and impact corporate goals.

In most organizations, investigation of abnormal events is viewed as an important activity. When an extraordinary incident occurs, its investigation may temporarily impact other work assignments. As a result, determining what occurred and why becomes a high priority assignment.

Following are the most familiar incident investigation activities.

Step 1. Management assigns responsibility for incident investigation.

Step 2. Data are collected, including a chronology of events and complete incident description.

Step 3. Data are analyzed to determine how and why the incident occurred (i.e., cause analysis).

Step 4. Appropriate corrective actions are developed.

Step 5. An investigation report is prepared and presented to management for approval.

Step 6. Follow-up is performed to ensure that corrective actions have been completed and have corrected the incident cause(s).

Step 7. The incident report and supporting information are filed in a manner that facilitates future retrieval and use.

This article focuses on the final two activities—activities that are often omitted or completed in a haphazard manner which detracts from an otherwise comprehensive investigation.

FOLLOW-UP ACTIVITIES

To be effective, corrective actions must be implemented as specified in the investigation report and as approved by management. However, a firm cannot presume that these actions will be implemented as intended. Requirements may be misunderstood or the appropriate action may be taken initially only to be discontinued later. Occasionally, those involved undermine or resist implementation.

An effective way to determine whether the intended action has been implemented is to go look. Ferry suggests that few corrective actions are implemented as intended, so a double-check in the field is needed to ensure that actions are taken and maintained (246). ANSI Standard for Information Management for Occupational Safety and Health (ANSI Z16.2-1995) recommends independent evaluations of corrective actions to determine their effectiveness (20). Feedback from such evaluations may lead to modification of these actions, new corrective actions or further study of the incident cause.

Review of corrective action implementation may also reveal that a thought-to-be-appropriate corrective action did not fix the problem. The root cause may still exist, or the investigating team may have identified the incorrect root cause. In such cases, it may be necessary to reconvene the team to re-evaluate corrective actions.

Did the corrective action fix the problem, or does the underlying cause still exist? If the problem recurs, or was never eliminated, one may find that the wrong solution—or only a partial solution—was implemented. For example, suppose that in response to flash burns to eyes of employees working near a welding station, welding curtains were installed. Although reduced in frequency, some workers continued to receive flash burns. Reinvestigation revealed that the cause was arc reflection off the white ceiling above the welding booth. The implemented solution had addressed only one part of the problem; a coat of flat black paint on the ceiling solved what remained.

Are corrective actions still effective? Following an unplanned release of chemicals from an industrial process, a new process control panel was installed. This panel increased monitoring capability of process temperatures and pressures. No repeat incidents occurred until a plant layoff caused older operators to be assigned to the control room where the panel was used. These operators had difficulty reading the small scales on the pressure- and temperature-indicating dials. Subsequently, another release occurred when an operator misread a gauge. The new control

FIGURE 1 Example of a Corrective Action File Index

Issue ID A12345

Action No. 02

✔ 1. The incident report.

✔ 2. Approved incident investigation report.

✔ 3. Corrective action requirements.

a. Identify electricians needing LO/TO training.
b. Develop LO/TO training.
c. Conduct training of electricians.
d. Assess performance of trained electricians using LO/TO permits.

✔ 4. Closure evidence (Corrective Action Reports).

a. Letter from J. Smith, Maintenance Superintendent, to M. Brown, Training Manager, "List of Electricians Who Require Lockout/Tagout Training," June 15, 2000.
b. Cover sheet of training module #5678, "Lockout/Tagout," August 15, 2000.
c. Training attendance roster, August 20, 2000.
d. LO/TO self-assessment report, October 1, 2000.

Closure Evidence Complete: J. Allen 10/15/00
File manager/Date

panel was still needed, but modifications were required to ensure its effective use.

Have conditions changed such that the corrective action is no longer needed? Due to the potential for damaging valuable inventory, forklifts were prohibited from entering a storage room. Subsequently, the area's mission changed and inventory was removed, but the posting remained. Years later, workers needed to transport heavy equipment into the room. However, due to the sign, they used manual devices instead of forklifts. The outdated sign placed inappropriate restrictions on material handling activities. Revisiting corrective actions and periodically challenging their need prevents obsolete requirements from remaining in effect.

Is the corrective action still needed, yet no longer being performed? Often, corrective actions are implemented only to be discontinued later. For example, as a result of failure to properly inventory certain chemicals, a safety requirement was violated. Subsequently, an improved inventory log was created. To ensure its use by operators, the area supervisor was expected to review and sign the log after every 10th entry. The log was effective, but an audit revealed that the supervisor had stopped the reviews after a few months. Management involvement helped him resume this assigned responsibility.

Did the corrective action create new hazards? In some cases, solving one problem creates a new one. Thus, those involved must watch for undesirable conditions caused by implementation of corrective actions. For example, a ventilation system in a building housing hazardous chemicals was modified to create a negative pressure in the work area and to exhaust through a bank of HEPA filters. Following this modification, certain plant doors had to be closed to maintain the negative pressure. Consequently, temperatures in work areas increased nearly 10°F, creating heat stress concerns. Preventing airborne releases of hazardous chemicals solved the environmental concern, yet created other hazards for workers.

Did the investigation identify all issues of concern? A filter failure caused several hundred gallons of lubricating oil to be dumped on a process area floor. Investigation identified a design problem in the filter gasket as the cause. A separate review performed after the investigation was completed revealed that lack of emergency response supplies in the building where the spill occurred had hampered initial response efforts. It was discovered the emergency inventory of mops, dams and absorbent materials had been consumed during routine building activities. The original investigation resolved the gasket problem, but did not address the use of emergency response supplies during routine operations.

INCIDENT RECORDS & FILES

OSHA's Process Safety Management standard (29 CFR 1910.119) requires investigation of incidents that result in, or could result in, a catastrophic release of a highly hazardous chemical. Investigation requirements include preparation of a report and recommendations; in addition, findings and recommendations must be resolved promptly, and corrective actions documented. Similar requirements exist for EPA's Risk Management Program (40 CFR 68, Program 3) (Hansen, Alderman and Franklyn 29).

To progress toward safety excellence, it is necessary to review historical data and revisit lessons learned. Failure to learn from mistakes undermines a safety program (Cwikla 12). Occupational injuries are made worse when they are the result of problems that supposedly have been corrected.

Preventing recurrence is a key function of the safety professional. How does one know whether the same or a similar incident has occurred before? One way to obtain factual information on past events is to examine incident records. A complete file can provide key safety-related information; it also facilitates efforts to determine whether history is repeating itself. High-quality incident records help answer the question: Are we learning from—or merely repeating—past mistakes? Conversely, lack of complete investigation records inhibits the transfer of knowledge.

File Contents

Corrective action reports and supporting documents should be prepared and filed in a manner that facilitates their use. Although actual contents depend on a site's needs, the following documents are typically found in a corrective action file.

1) **Index.** Figure 1 shows the index of a typical file. The index helps the file manager ensure that required documents are present and helps the file user find needed information. Large files should be categorized by topic (e.g., falls or back injuries).

2) **Incident report.** Future file users will want to know what event prompted corrective action. Including the incident report—along with the names of those involved—helps subsequent file users identify sources of additional information.

3) **Investigation report.** This report should identify investigation results, members of the investigation team, incident causes, recommended corrective actions and management approval.

4) **Corrective action report(s).** This report should describe actions taken to prevent recurrence and solve identified problems. It should identify each action and target dates, as well as who is responsible for implementation. If alternative actions are taken in lieu of those specified, the report should include management approval of the alternatives. If a large number of findings exist, assigning a unique identifier to each facilitates tracking and retrieval. Figure 2 depicts a sample corrective action report.

5) **Closure evidence.** The file should include evidence of the corrective action taken. For example, if the corrective action is training, it should include the list

of attendees. If a procedure is revised, the file should include the cover page of the procedure, along with pages that address the finding. Documentation of independent closure verification, if applicable, should be included as well.

File Storage

Files should be stored in a secure location that is not susceptible to damage. Placing them in an unheated, unlighted and unattended storage area subjects them to potential loss from weather, rodents or vandalism.

How long should files be kept? There is no simple answer to this question. Each site has unique characteristics that dictate how long is long enough. A rule of thumb: Review and summarize corrective action files when they become five years old. Files involving serious incidents should be kept longer, perhaps for the life of the facility. One must also be careful to not discard any documents required by regulators.

A central file manager should be assigned, and closed files transferred to this manager. S/He should establish a logical filing scheme and strive to achieve a degree of consistency among files, regardless of the originating source. Publishing an index of files helps potential users become familiar with their contents.

Corrective action file management and tracking can be a challenge. When large numbers of corrective actions must be managed, these responsibilities should not be assigned to the safety professional nor to the quality assurance (QA) organization. Files are records. An administrative group equipped to use the latest technology and techniques for record management is the best choice. Further, this arrangement is typically less expensive. In addition, it enables the safety professional or QA representative to focus on important safety or QA tasks.

Lessons Learned

Lessons learned from incident investigations should be shared with those who will benefit. Sharing also fosters interaction between managers and helps develop a sense of mutual aid and support. Incident precursor events should be trended and used as learning tools.

For example, one lesson learned from the Three Mile Island reactor incident was that information generated on reactor operations was not being systematically reviewed to extract potentially important trends. Trending should include not only large incidents, but also incident precursors and all other safety problems. Without such monitoring, minor discrepancies can lead to an acceptance of marginal or inferior performance that may culminate in a more-significant incident.

Managers can use these files to identify items to spot-check during plant inspections or self-assessments. Personal involvement is the best way for management to communicate the importance of corrective action implementation.

FIGURE 2 Example of a Corrective Action Report

Issue ID A12345	**Action No.** 02	**Date Opened**	06/04/00
Action Owner	Smith, L.J.	**Date Due**	08/30/00
Responsible Organization	Maintenance Training	**Date Closed**	08/15/00

Source Title
Near Miss During Maintenance of 480V Breaker.

Issue Title
Lack of Lockout/Tagout (LO/TO) Training for Electricians.

Action Status
Closed.

Action Description
Develop LO/TO training module for electricians servicing systems up to 600V.

Notes
Training module #5678, "Lockout/Tagout" issued effective 08/15/00.

Signatures

L.J. Smith **8-16-00**
Action Owner/Date

Not applicable
Independent Verifier (if required)/ Date

IMPORTANCE OF CORRECTIVE ACTION MANAGEMENT

Failure to manage corrective actions can be costly. In the nuclear industry, the typical commercial nuclear facility license application to the Nuclear Regulatory Commission (NRC) commits a utility to investigate abnormal events; identify corrective actions to prevent their recurrence; and follow-up the implementation of corrective actions. Failure to meet these obligations can result in serious consequences.

For example, in December 1997, NRC proposed the largest civil penalty ($2.1 million) in its history against a utility for violations that included failure to have an effective corrective action program (NRC). Although problems with corrective action management rarely result in such severe consequences, this penalty emphasizes the importance of correcting identified problems.

CONCLUSION

Investigating incidents and assisting with resolution of the associated causes are important elements of a safety professional's job. The safety professional's involvement helps ensure that corrective actions are correctly implemented and that associated files are organized in a manner which facilitates subsequent review. Incident investigation records and files provide details that can be used to prevent incident recurrence. Failure to properly manage corrective actions can have adverse effects on health, safety and economic performance. ■

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