GENERAL MANAGEMENT

"INCIDENT MANAGEMENT"

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INTRODUCTION

Imperative for success in Business, Industry has to strive to eliminate all safety and environmental incidents. Continued improvement towards the goal of zero incidents primarily requires effective investigation of the incidents that do occur to prevent their recurrence. The secondary purpose of incident investigation is to evaluate the other system elements. The task of Incident investigators is to gather information, analyze the facts surrounding the information and render report.

DEFINITION

Management, reporting and investigation of incidents, such as but not limited to fires, explosions, spills, vehicle collisions, malfunctions, treatment plant upsets, etc. that result in any of the following negative outcomes :

Injury or illness to an employee, contractor.

Damage to property

Exceedance of an environmental permit or regulatory limitation;

Release to the environment

The term "incident" may also include "near misses", which are unplanned, undesired events that could have resulted in negative outcomes but did not.

INCIDENT OCCURANCE

Incidents result from errors. An error can be something simple, such as taking a shortcut to save time, or it can be something of a more complex nature involving poor design, lack of sufficient management controls, or pressure to complete work with limited time or resources. When hazards and errors come together, incidents can occur.

Incident prevention is typically accomplished by establishing successive barriers and defenses to eliminate or reduce the impact of errors. The function of these defenses is to minimize the potential impact of undesired occurrences to colleagues, assets and the environment.

In an ideal world safeguards, or defensive layers, create an inherently safe, productive, and environmentally friendly work site. In reality, safeguards are not perfect and often have weaknesses and shortcomings.

In the Swiss Cheese Model of incident causation shown below, these weaknesses and shortcomings are represented by the holes in the cheese. Each slice of cheese represents a defensive layer. The presence of a hole in any single layer may not result in an incident. However, when the holes, or errors, in the layers align, the risk of an incident is significantly increased.

The three slices of cheese in the model above represent the three categories of safeguards or defensive layers -- Organizational, Process, and Behavioral. Incident investigations and prevention efforts should seek to identify and correct flaws in each of the layers.
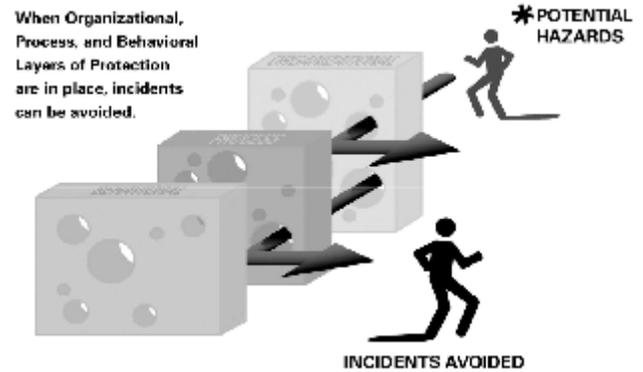
INCIDENT INVESTIGATION

An effective incident investigation details :

What happened, when it occurred, and how it occurred (i.e., timeline of events) All contributing factors (i.e., deficiencies in Organizational, Process, and Behavioral safeguards) that played a role in the occurrence; and Corrective and preventive actions necessary to prevent recurrence of similar incidents (e.g., lessons learned). The problem with some incident investigations is that they do not go far enough. They only identify and address the behaviors and conditions at the time of the incident. They do not consider what prompted or allowed the identified behaviors and conditions to exist in the first place.

Incident investigation is a powerful tool to identify each of the failures that led to an incident so they can be corrected to prevent similar incidents from recurring. An effective incident investigation will examine all the relevant organizational, process and behavioral factors associated with the incident and look for ways to enhance the prevention measures and safeguards.

DETERMINING APPROPRIATE LEVEL OF INVESTIGATION

It is good practice to investigate all incidents, including "near misses". Each incident that is not investigated is potentially a missed learning opportunity. The depth and detail of each investigation usually corresponds with the perceived severity. However, the objective to determine what went wrong and what can be done better is the same, regardless of severity. Even investigations of near misses can be useful since it is often a matter of

circumstances such as time, distance, positioning, or sequencing that determines the consequences of an incident.

GATHERING THE INFORMATION

It is important to visit the incident scene and capture information as soon as possible after an incident occurs. The incident scene should not be disturbed until the investigation has taken place. If necessary, stop work and prevent unauthorized access. In certain instances, the scene will need to be secured until regulatory agencies have visited the scene and authorized release of the area Describe the chain of events leading up to and immediately following the incident, recording the factors in chronological order.

VERIFICATION OF FACTS

Rely on the facts. Keep an open mind and consider everything that might have contributed to the incident. It is important to conduct the investigation in a manner so that it is clear that the objective is to determine the contributing factors and to identify corrective and preventative actions, not to assign blame.

IDENTIFY THE SITUATION PRIOR TO THE INCIDENT

Normally incidents occur because of several contributing factors. Factors which initially appear remote in terms of time or direct influence, can increase in importance as the investigation proceeds. Record these observations as early as possible during the investigation process.

ASCERTAIN AND EVALUATE THE ACTIVITIES BEING CARRIED OUT AT THE TIME ON INCIDENT

Provide a good description of the following items, including all the relevant details :

> The surroundings (internal, external, manufacturing, utility area, waste treatment, etc)

> The condition of the working surface (clean, wet, oily, sloping, etc)

> The equipment/material being used – note all

> details available

> The position of valves, switches, equipment, vehicles, tools , etc.

> The number of persons engaged in the activities and their actions and behaviors.

Photograph the scene. Take a general view and close-ups of relevant items and equipment.

INTERVIEWS

It is crucial to get information from those directly involved, their line management, witnesses, and those observed in the area prior to the incident. Interviews should take place in familiar surroundings; the interviewee should feel comfortable. The style of interviewing is critical. It should be frequently re-stated that the purpose of the investigation is to prevent a reoccurrence, through identifying and correcting the contributing factors. The emphasis is on prevention, not blame. Conduct separate interviews to prevent individuals from influencing each other. Questions, when asked, should not be intimidating.

ANALYZING THE INFORMATION

The analysis of the information gathered should be performed in a systematic way to ensure that it is comprehensive and free from bias. Various tools and techniques may be helpful for managing all of the information and determining the contributing factors. These tools are especially valuable as the complexity of the investigation increases. Each method has its strengths and weaknesses. These techniques include but are not limited to Events and Causal Factors Charting, Barrier Analysis, Change Analysis, and Root Cause Analysis. The analysis should consider all possible contributing factors. Keep an open mind with the goal of a thorough, systematic and objective review of the evidence.

IDENTIFYING THE CONTRIBUTORY FACTORS

It is essential to identify the factors that have contributed to an incident. Most incidents will have more than one contributing factor; consequently, the

causes of safety and environmental incidents need to be examined from seemingly distinct, but usually very much interrelated and interdependent perspectives. To facilitate the investigative process, it is recommended to use the following categories of contributing factors :

Behavioral

Process

Organizational

When an incident occurs, normally the most visible factors are the behaviors; however, organizational and process factors have a significant influence on the development of the behavioral layer. It is therefore necessary to examine each of the layers for contributory factors and not only the behavioral layer.

BEHAVIORAL FACTORS

Behavioral factors refer to what people do or do not do. The greater the knowledge and skills, the greater the likelihood of understanding potential hazards and identifying the necessary actions that must be taken.

> Positive mindset.
>
> Knowledge, awareness, and constant attention to the surroundings and potential hazards
>
> Adherence to applicable rules, standards, procedures, critical behaviors precautions and warnings
>
> Evaluation and recognition of potential consequences of personal actions
>
> Seeking appropriate advice and assistance for difficult tasks or unfamiliar situations

PROCESS FACTORS

Process factors refer to the equipment, materials and surrounding environment, as well as the procedures and established work sequence and flow.

Consider the following questions. If the answer to a question is "YES", regard this as a possible process factor related to the incident. Design, layout and access of work area and equipment Safety Devices (guards, interlocks, alarms, etc) Organization and planning of work

> Selection and use of materials and equipment
>
> Inspection and maintenance of tools, equipment and work areas
>
> Procedures and methods
>
> Environmental and working conditions
>
> Area hazards and poor housekeeping can have a significant impact on the potential for an incident.

ORGANIZATIONAL FACTORS

Organizational factors refer to the basic values, norms, beliefs and practices that characterize the functioning of an institution. They define the expectations and the management system for the safety and environmental culture that evolves. If gaps are discovered in the organizational layer, they should be viewed and handled as opportunities to enhance and improve the effectiveness of the layer.

Organizational Factors to evaluate as part of the incident investigation process include:

> Vision, core values, SHE policy, strategy, objectives, and expectations
>
> Standards, regulations and other legal requirements
>
> Structure and responsibility
>
> Training, awareness, communications and ensuring competency
>
> Supervision and operational control of work
>
> Planning for hazard identification and control of risks
>
> Management of Change
>
> Providing for participation and involvement

Performance measurement and monitoring

Observing and Coaching

Incident investigation and management of corrective and preventative actions

The Availability of Professional Resources

HUMAN ERROR

Human error is frequently equated to personal behavioral factors. In other words, if something goes wrong, it seems obvious that an individual (or group of individuals) must be responsible. However, human error can occur across each of the defensive layers. These errors can range from failures that have a short time impact (e.g. lapses, fumbles, mistakes, and procedural violations) to those that are more long-lasting (e.g., untrustworthy alarms and indicators, unworkable procedures, design and construction deficiencies, etc).

BASIC ERRORS

Identifying the error types provides valuable information that will help identify the corrective and preventive actions necessary to prevent recurrence.

Learning and Memory Gap Errors.

Procedure Gap Error

Application Gap Errors

MINDSET ERRORS

In addition to the basic errors, humans are prone to errors related to the lack of a proper mindset or motivation. Individuals perform unsafe acts even when they know the safe thing to do; however, they sometimes lack the proper motivation and proper mindset to make the right choice. The following categories of mindset error traps can also lead to safety and environmental incidents :

Inconsistent Assessment of Consequences

Normalization of Deviance

Group think

ASSIGNING PERSONAL ERROR AS THE SOLE FACTOR

Incident investigations which conclude that personal error was the sole factor in an incident, without looking at contributing factors underpinning this error, are usually superficial and are rarely acceptable.

IDENTIFYING CORRECTIVE AND PREVENTIVE ACTIONS

After all the contributing factors and error types have been identified, the next step in the incident investigation process is to determine the necessary corrective and preventative actions. Corrective actions are the actions that are needed to rectify the existing situation. Preventative actions are the risk control measures that need to be taken to block a similar type of incident from recurring.

On the other hand, if knowledge of the hazard or procedure is the problem, additional training, hazard awareness communications or clarification of procedures may be the best solution to address the learning gap or procedure gap errors.

IMPLEMENTING CORRECTIVE ACTION PREVENTIVE ACTION (CAPA)

The CAPA should consist of objectives that are Specific, Measurable, Actionable, Realistic, and Time-based. Actions with the highest priority should generally be implemented the soonest. The highest priority actions are those measures that ensure that an incident does not recur today.

Relevant risk assessments should be reviewed following an incident. The incident investigation should highlight areas of the risk assessments requiring improvement.

In addition to specific risk assessments, a general review of the risk assessment program may be required.

UNDERSTANDING INCIDENT COSTS

DIRECT COSTS

Medical expenses, Workers compensation, Damage to machines and equipment, Insurance and Legal

Expenses.

INDIRECT COSTS

Lost Time – injured worker, Loss of efficiency and production, Training costs, Replacement costs, Hardship to family, Damage to the company image, Loss of customers, Pain and suffering.

INCIDENT INVESTIGATION CLOSEOUT

The incident investigation should remain open until all CAPA related items are closed and the risk assessment has been updated.

CONCLUSION

A systematic and focused approach in investigation of incidents paves the path for ensuring effective corrective and preventive actions which can identify and fix all grey areas and prevent recurrence of incidents. Each "Incident" which may also include "near misses", which are unplanned, undesired events that could have resulted in negative outcomes but did not when investigated enable us to learn and pave way for continuous improvements to overcome occurrence of incidents. The detailed and in-depth understanding of the Behavioral, Process and Organizational factors will allow us to build in barriers to block the occurrence of incidents. Incident investigations are the single most important component of incident prevention program because they prevent reoccurrence. Unsafe acts and conditions left uncorrected are likely to result in more serious events. Investigations identify processes and procedures that need modifications or improvements. It can be concluded that the benefits of Incident investigation and Management program prevents incident reoccurrence, improves employee morale, demonstrates Management commitment, improves methods (or) process, meets regulatory requirement and improves profitability.

REFERENCES

1)   Guide to Accident / Incident Investigations – Colorado State University http://www.bernardino.colostate.edu/OHSS/OHSSHandouts/ohss_Accident_Investigation.pdf

2)   Incident Investigation and Root Cause analysis