

Management Reviews of Process Safety

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Managers within the process industries bear a wide range of responsibilities. While environment, health and safety are typically major responsibilities, managers are also rated on goals for productivity, quality and costs, amongst other things. Manager's work daily to maintain adherence to standards of performance in these areas, and to attain annual performance goals. Over time, however, industry norms can change. Performance standards for Process Safety, and the methods used to manage it can become outdated. Through organizations such as the Center for Chemical Process Safety, the European Process Safety Centre and the Institute of Chemical Engineers, improved methods for identifying, measuring and managing process risks continue to evolve. Over the span of a few years, a management team performing well to their own methods and measures can fall behind the industry standards. Through the use of Management Reviews, senior management can ensure the continuous improvement in risk management. Instead of asking if Management of Change requests (MOCs) are being written when required, a Management Review would ask if MOCs are required for the right things. Instead of asking if the required risk assessments are being performed, a Management Review would ask if we are using the right risk assessment methods, at the right times. These types of questions will lead to continuously improving Process Safety Performance.

Introduction

Line managers have a great responsibility to ensure the safety of their processes. However, even the best Process Safety programs can become stagnant and outdated. Changes and improvements in regulations, industry practices, and consensus standards can result in a company utilizing outdated practices if they do not continually improve their Process Safety programs. If line managers are responsible for Process Safety, then they are also responsible for keeping programs current and continuously improving performance. It is incumbent upon them to periodically review performance against their internal standards, and to benchmark internal standards against those of the industry as a whole. Management Reviews of Process Safety cause an organization to ask not only "Are we meeting our own standards," but also "Do we set the right standards" and "how do we compare to the practices of our peers?"

Management Responsibility

The list of Front Line Management's responsibilities is long. Their primary job is to manage all aspects of producing the company's product. This includes equipment uptime, staffing, scheduling production and personnel, and many other aspects. Producing product to the correct quality and performance specifications also rests with line management. If product is being produced that doesn't meet quality specifications, it is up to line management to make the necessary adjustments to equipment, process parameters and production procedures to correct the problem. They must accomplish all of this within the budget they prepared for the current time period. Unforeseen expenditures for equipment breakdowns, additional personnel and changes to manufacturing methods must be fitted into the budget, which likely involves a reduction of money planned for other activities.

Middle and upper management are also primarily responsible for producing the company's product. In addition to overseeing the activities of lower levels of the organization, they are responsible for the strategic direction of the company, and the selection of tactics to achieve the strategic goals. This includes market selection, capital spending strategies, and meeting expansion needs, among many other activities. In addition to these responsibilities, the entire line management organization bears direct responsibility for Process Safety. Their commitment to process safety is of primary importance.

Many of the activities necessary to ensure the safety of the process are carried out by front line managers. They must understand the hazards of the process and the key risk control measures and safeguards. They are responsible for implementation of many policies and procedures. They develop operating procedures and safe work practices, and ensure employees are complying with them. They develop and conduct training, as well as establish and enforce competency requirements. They coordinate with and sometimes manage contractor personnel, as well as respond to and investigate incidents. They participate in issuing Hot Work Permits, scheduling Mechanical Integrity activities, and identifying changes that require review through the Management of Change process.

As one moves up the line management organization, the goals and activities for process safety become much more strategic and tactical like the business objectives do. Process safety aspects such as policy-setting, commitment to process safety and measuring performance are the responsibility of these levels of management. They also play a large role in setting the culture of the organization as it relates to process safety (and many other aspects of the organization). In addition to making a personal commitment to process safety, they must do so on the company's behalf. They are responsible for demonstrating this commitment through activities such as capital spending on process safety. They also must demonstrate their commitment to process safety in more visible ways. This can be accomplished through setting process safety-related goals for the organization, including process safety on the agenda during facility visits, and talking about process safety with facility and front line managers as well as employees. They must expect and demand performance in process safety, and continuously measure the outcomes of the process safety program. Through their commitment and activities, a culture of process safety causing the right things to happen will be created.

Process Safety Staff Responsibilities

Some companies have established staff positions dedicated to process safety. Others have designated Program Champions for areas of Process Safety such as Management of Change, Mechanical Integrity, Hot Work Permits, etc. Program Champions often fill these roles in addition to other responsibilities such as engineering and production management. Some companies have Subject Matter Experts for dedicated to specialist areas such as leading Hazard Studies, emergency relief sizing, and Quantitative Risk Assessment.

All of the above have the responsibility of assisting the line organization, either directly or indirectly, in effectively managing process safety. They do this through providing technical expertise, services and systems of work for activities such as Management of Change and Hazard Studies. They may be responsible for maintaining Process Safety Information, or measuring process safety performance.

Like line managers, higher-level Process Safety Professionals are responsible for different things. At the division or corporate level, they may measure the Process Safety performance of a business sector or the company. They recommend strategic and tactical direction to upper line managers, and provide assistance and expertise to facility-level personnel. They may also conduct audits to ensure performance meets expectations. They may also develop corporate policies to ensure compliance with applicable regulations, as well as to provide standardized practices throughout the company.

Table 1 –Elements of Process Safety for MRPS (CCPS)

- Standards Compliance
- Process Safety Competency
- Process Knowledge
- Risk Assessment
- Operating Procedures
- Safe Work Practices
- Asset Integrity
- Contractor Management
- Training and Performance Assurance
- Management of Change
- Operational Readiness
- Conduct of Operations
- Emergency Management

Continuous Improvement

Generally, industry performance improves over time in all areas, and Process Safety is no exception. Many companies develop innovative and more efficient processes for managing Process Safety. Member companies of organizations such as the Center for Chemical Process Safety (US), American Institute of Chemical Engineers (US), Institute of Chemical Engineers (UK), and the European Process Safety Centre (EU) continually share methods and best practices for process safety. A Best Practice developed within one company may later become standard practice for the industry.

Symposiums and conferences dedicated to Process Safety also provide a means of sharing new information, methods and best practices in Process Safety. Major conferences include the Global Congress for Process Safety (US), Hazards conference (UK) and the International Symposium on Loss Prevention and Safety Promotion in the Process Industries (EU).

There are many standards-producing organizations that provide recommended practices related to process safety. The German Institute for Standardization, American National Standards Organization, International Electrotechnical Commission, American Petroleum Institute, British Standards Institute and American Society of Mechanical Engineers all produce recommended practices, some of which have been adopted as legal requirements.

The organizations above, and many others who provide valuable Process Safety-related guidance, are dedicated to continuously improving their recommendations to industry. Changes may come about due to industry incidents, member company experiences, new technologies, etc. What was permitted by a particular standard a few years ago may no longer be permitted by the latest version of that standard. Often new requirements are included in updates to standards and regulations. Keeping abreast of the latest version of regulations, law, standards and best practices can be a daunting task. Failure to maintain awareness of changes can leave a company's Process Safety practices outdated.

Management Reviews

As stated earlier, line management has direct responsibility for Process Safety performance. It is they who have the authority to implement sound Process Safety practices. Employees in Process Safety roles are responsible to provide line management with the expertise, knowledge, recommendations and tools they need to fulfill this responsibility. Process Safety personnel are likely the ones responsible for staying abreast of changing process safety standards, regulations, industry norms and best practices.

Purpose

In some manner, these changes must be communicated to and reviewed by line management to determine what benefits they might offer to them. One method of accomplishing this is through a program of Management Review of Process Safety (MRPS). The purpose of the MRPS is to review the requirements of the topic under review, current performance, and benchmarking against other company facilities, company requirements, and external references such as other companies, recommended practices, regulations, etc. Comparing facility practices and performance to others helps one to understand if sufficient efforts are being made for Process Safety. Assuring regulatory requirements are being met is of paramount importance to most companies. Relevant Good Practices, standards and recommended practices will help to benefit from the knowledge and experience of other companies, allowing utilization of proven methods of risk management.

Review Topics

All aspects of Process Safety should be considered during a MRPS. This would include major Process Safety Elements such as those shown in Table 1. To ensure an in-depth review, only one topic should be undertaken for review at a time. The time available from line managers is limited, and their focus during the review is critical. Limiting each review to one topic will prevent rushing to get through all of the topics, and provide efficiency of thought. A schedule can be developed to periodically review one topic, with each topic reviewed every two to three years. The author's facility chose a quarterly review frequency. The relative infrequency of reviews prevented them from becoming routine, check-the-box activities. This also provided ample time for recommendations to be implemented and their effectiveness to be measured.

Participation

MRPS should be held at major levels of an organization, up to and including the Board of Directors. Facility-level reviews are likely the lowest level, although at very large facilities it may be beneficial to hold reviews for major process units. Each level will obviously have different participants.

A standard list of participant types should be included in every MRPS, regardless of the level of the company at which the review is taking place. These include:

- Most senior manager for the organization segment being reviewed – Site Director / Plant Manager, Division Manager, subsidiary President, Corporate CEO.
- Direct reports of the most senior manager, as they often are responsible as a group for the operations of the unit under review, or their areas of responsibility are often impacted (e.g. finance, quality, R&D, etc.).
- Most senior line manager – Operations/Manufacturing Manager, VP-Operations/Manufacturing, etc.
- Most senior Safety, Health and Environment Personnel
- Process Safety Personnel.

Others, if not included above, should participate in the MRPS based on what aspect of Process Safety is to be reviewed. Table 2 shows typical participants by review topic.

Table 2 Common MRPS Participants

Topic	Senior Mgmt.	Ops	SHE	SME / Pgm. Champ.	Finance	Quality	R&D	Maint.	Purch.	Human Resources
Standards Compliance	X	X	X	X			X	X	X	
Process Safety Competency	X	X	X	X		X	X	X		X
Process Knowledge	X	X	X	X		X	X			
Risk Assessment	X	X	X	X	X		X	X		
Op. Procedures	X	X	X	X		X		X		X
Safe Work Practices	X	X	X	X				X		
Asset Integrity	X	X	X	X	X	X		X	X	
Contractors	X	X	X	X				X		
Training and Perf. Assur.	X	X	X	X				X		X
MOC	X	X	X	X		X	X	X	X	
Op. Readiness	X	X	X	X		X		X		
Conduct of Op.	X	X	X	X		X		X		X
Emerg. Mgmt.	X	X	X	X				X	X	

MRPS Agenda

The agenda for MRPS meetings can be fairly standard, regardless of the topic or the level within the organization at which the review is held. It should include a review of existing practices and performance, but just as importantly must focus on continuous improvement. One must determine if our procedures are adequate, implemented, achieving the desired results, and meeting industry and regulatory standards.

Current Practices

Current policies and procedures for the topic under review should be reviewed. This should focus more on scope, application and authorities than the actual mechanics of accomplishing tasks. Questions to be answered at this stage include the following:

- Is the scope correct?
- Are we including all of the activities that we should?
- Are we working on the right things?
- Is our written program adequate and up to date?

Current Performance

Recent performance against the current policies and procedures should be reviewed. Performance shortcomings must be addressed – there is little benefit in expanding the scope or activities if the current expectations do not match actual practice. Questions to be answered include:

- Are we implementing the policy as written?
- Are our metrics effective at measuring the results we wish to achieve?
- Are we getting the results we want?
- What are the findings of internal and external audits?
- What incidents have we experienced related to the topic under review?

Benchmarking

After review of current procedures and their effectiveness, the program under review should be benchmarked against the practices of other facilities and companies. If new practices have become standard across your industry, you are likely to benefit from implementing these practices as well. Changes to Relevant Good Practices such as Product Stewardship Manuals and the consensus standards organizations mentioned earlier should be reviewed to ensure your practices have changed accordingly where necessary. Questions to be answered include:

- What Relevant Good Practices exist, and are we implementing them?
- How do other companies in our industry manage this aspect of Process Safety?
- What have we learned from industry incidents relevant to the topic under review?

Review of Relevant Regulations

Although legal requirements often represent minimum performance goals, all applicable law should be reviewed and compared to existing practices. One must provide assurance that minimum legal requirements are met. Questions to be answered include:

- What are the regulatory requirements for this aspect of Process Safety?
- What are the minimum requirements, and do we meet them?
- Are any regulatory changes anticipated?

Recommended Improvements

Recommendations are likely to be made during each part of the agenda described above. These should be recorded as they are made for reference during review of subsequent agenda items. Recommendations made during the current practice review are sometimes altered or dismissed during benchmarking against other programs. At a minimum, recommendations must include the intended goal to be achieved. It is not unusual for specific tactics for achieving a recommended goal to be determined after the review, including a wider group of stakeholders in the planning stage. It is very important that the tactics be reviewed and agreed upon later by the MRPS team.

Action Plan

At the end of the meeting, the accumulated action items should be restated, and responsibility for each should be assigned to an individual along with a completion date. If the goal is of the form “Develop a plan to improve performance to meet goal X,” then additional action items must be recorded after a plan has been agreed. These actions should comprise the steps necessary to implement the plan, and have assigned responsible persons and completion dates.

Each of the actions recorded must be tracked to completion, with accountability for completion by the assigned date. The status of outstanding actions from each prior MRPS can be distributed before each MRPS for review and, if necessary, discussion during the next MRPS.

Croda Experience

Croda has successfully engaged senior management in Process Safety through MRPS. Their level of understanding of the issues has increased, as has their level of assurance that risks are being adequately managed. Their input in continuous improvement activities

translates into commitment to timely completion of actions. Each MRPS lasts ninety minutes, during which time the existing program is reviewed and performance is assessed (although the metrics are published monthly). This is followed by comparison to standards and typical industry activities and performance. Improvement actions are assigned to senior managers, who may then assign them to individuals within their respective organizations.

Unforeseen results of the MRPS process include increased scrutiny of Process Safety as part of regular management activities. Management's deeper understanding of Process Safety, existing programs, and opportunities for improvement have resulted in more detailed discussions with operations and maintenance personnel.

Conclusion

Line management is responsible for ensuring adequate performance in Process Safety. This includes regulatory compliance as well as following Relevant Good Practice. In addition to ensuring the correct policies and procedures are in place, it must be shown that company practices match the written procedures. There is also a responsibility for continuous improvement, which includes adopting new industry practices, complying with revised regulations and standards, and staying current in best practices. One successful way of fulfilling these responsibilities is to conduct periodic Management Reviews of Process Safety. These reviews should address one area of Process Safety per meeting, covering all relevant topics over a 2-3 year period. During review of each topic, the scope, implementation effectiveness and performance of existing practices must be reviewed to ensure the desired goals are being met. Continuous improvement also comes from looking outside the organization to how other companies within your industry manage Process Safety. Industry groups and conferences dedicated to engineering or Process Safety can be great sources of information on evolving standard and best practices, RGP and regulatory changes. These reviews will ensure that your programs continue to cover what they should, and that incremental improvements are continuously made to your programs.