A Leader's Tactical Approach to Influence Changes in Process Safety Culture

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Abstract

Following the Texas City disaster and the subsequent publishing of "Failure to Learn" by Andrew Hopkins, many companies were awakened to the idea that their top leaders play a much more defining role in the success of their organization's integrated process safety program; process safety culture is driven by leadership. Once an organization recognizes that a process safety culture change is needed, the question then becomes, how do we engage top level leadership so that they influence culture? And, what tactical activities and behaviors can leaders promote and participate in that will have a notable outcome?

The authors' intent is to reach those in leadership roles who are on their journey to achieve process safety excellence and provide ideas and actions that they can take to move from "supporting" process safety to "leading" process safety. Leadership must execute strategic tactics to maintain and continuously improve one's process safety performance to achieve a Best in Class Process Safety Culture.   Leaders have the ability to influence overall safety and organizational culture through their actions and expressed priorities. Key topics covered by the author will include visible leadership, effective communications, risk based decision making, self-assessments, lesson learning, key performance indicators and active monitoring and feedback.

Note: Do not add page numbers. Do not refer to page numbers when referencing different portions of the paper

1.   Introduction

Investigations following recent process safety accidents in our industry have revealed that some companies' core values are geared toward personal safety with an insufficient amount of attention to process safety.   This has led to a much needed awareness by industry that a serious change is needed. This can only be accomplished by leadership changing the process safety culture. The ultimate goal is that the word "safety" will be all encompassing of process and occupational safety and they will be treated with equal reverence. Safety must become the way of doing business, or *the new normal*.

What is leaderships' role in process safety? Leaders share the accountability for the process safety and shape the culture of their organization. The core values leaders have, the goals leaders set, the metrics they drive, their words and actions (and inactions) influence the behaviors of each associate. They have a professional responsibility and opportunity to develop and execute strategic tactics to maintain and continuously improve the process safety performance and achieve a Best in Class Process Safety Program.   Strategies may include reducing the occupational injury rate by 50% over the next two years, reducing process safety incidents, and implementing a self-assessment program.   Once the strategies are determined, the question becomes, what are the tactical goals and plans to achieve these strategies? This paper explores the key roles and responsibilities of leadership and tactical approaches to integrate process safety into their day-to-day activities.

2. Integrated Process Safety Program

A strong process safety culture is integral to achieving the goals and value proposition set forth for an organization's process safety program. All business units across an organization, including sales, marketing and finance, must have a basic understanding of process safety. This awareness will benefit leaders in making risk-based decisions and understand how their actions effect the design, manufacturing and operating model at their sites and in turn process safety. Figure 1, Integrated Process Safety Road Map, is a simplified diagram of a process safety program. As shown in the Integrated Process Safety Road Map, the first step is to identify and understand the hazards and includes completion of various assessments such as a Process Hazard Analysis (PHA) or facility siting assessment. The output of these assessments establishes the necessary administrative and engineering safeguards which form the basis of the operating and maintenance discipline required to manage that hazard.

Operating discipline begins with the written operating procedures and training programs. The integrity of engineered safeguards is based on the execution of a robust mechanical integrity program. These management systems are sustained through the principles of Management of Change (MOC), Pre-Startup Safety Review (PSSR), incident investigation, and by consistent interpretation of risk using a Common Risk Matrix. The integrated program represents normal

operating practice; the point where organizations can have some degree of accomplishment toward their goals and strategies.

Figure 1: Integrated Process Safety Road Map
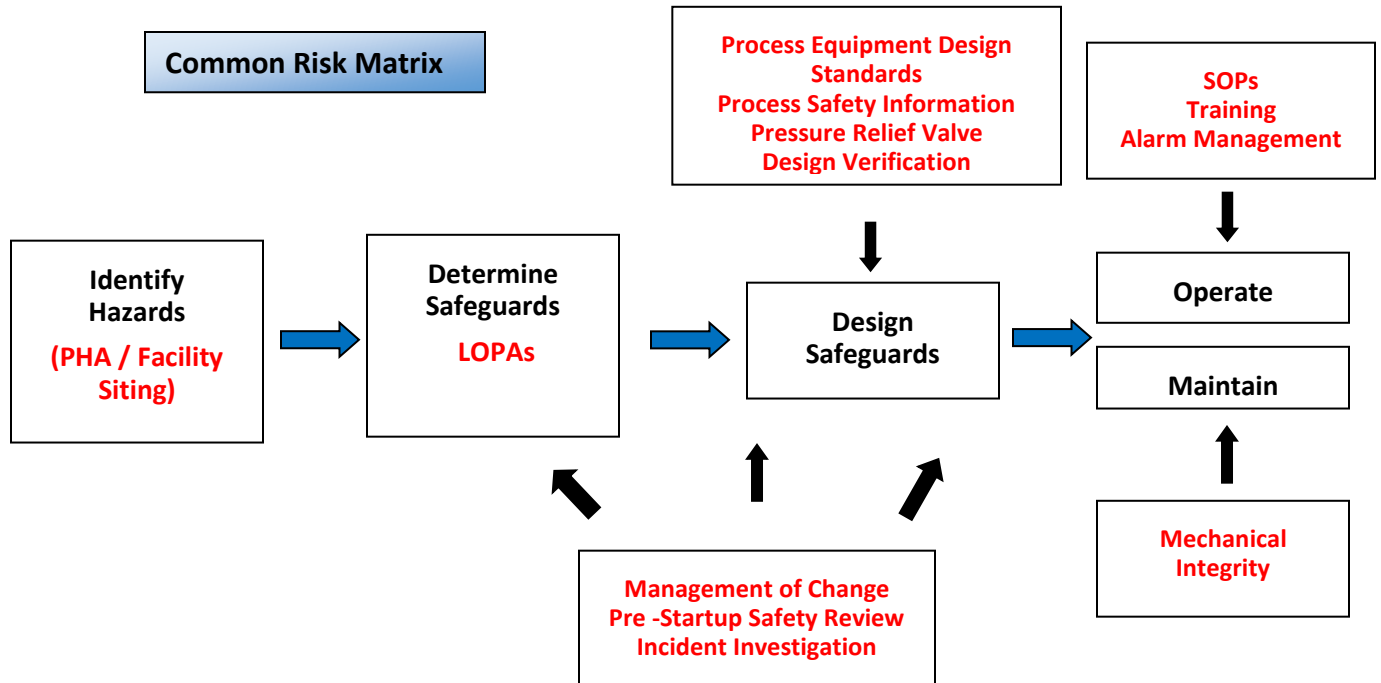
2.1   Commitment to a Strong Process Safety Culture

Once an organization recognizes that a change is needed in the process safety culture, the question is of course "how do we improve it?" One answer is to look at programs that are working, determine what works and learn from them. Occupational safety statistics have significantly improved across many organizations and industries over the last several years. How did leadership improve the injury rate? By making injury prevention a core value and thus a high priority by everyone. Many of the same tactics that were used to improve occupational safety culture can be used to influence process safety culture. Organizations must commit the same level of energy and investment to process safety as that which has been committed to improving occupational safety. Table 1 is a simple exercise to compare the proactive activities that are occurring around occupational safety to those geared toward process safety. Leadership can use the table as a starting discussion point to determine what the differences are within their organization and what can be done to improve.

Table 1. How does Process Safety compare to Occupational Safety? (Example)

Proactive Activities	Occupational Safety	Process Safety
Monthly site meetings	Actively Occurring	Sometimes Occurring
Leadership inspections	Actively Occurring	Sometimes Occurring
Incident investigations	Actively Occurring	Actively Occurring
Communicating lessons learned	Actively Occurring	Sometimes Occurring
Celebrating accomplishments	Actively Occurring	Not Occurring
Refresher training	Actively Occurring	Not Occurring
Scorecard visibility	Actively Occurring	Not Occurring

2.2 Visible Leadership

Leaders possess many roles and talents such as their experience, education, knowledge, determination and drive. Leaders are challenged to collectively focus these talents to achieve their organization's vision. Leaders are continuously being asked to improve in all aspects of their business and they in turn must ask the same from their associates. Visibility in the organization encourages positive engagement from associates at all levels and also allows leaders to better understand how their business decisions and actions impact process safety. Leaders should understand what the hazards are in their facilities and ensure safe guards are in place to manage risk effectively.

Plant Safety site inspections are an excellent approach for leaders at all levels to be active in their facilities. By spending time talking to frontline staff and operators, leaders have a chance to have a firsthand interaction with employees. This interaction shows associates that leadership is interested in what they are doing and how they are doing their job. Leaders should have a personal goal to spend some portion of time in the plant talking to operations and maintenance personnel. It is important that leaders use active listening skills to gather information. This interaction should foster an open, honest and constructive dialog between themselves and associates. The aim is to listen and learn.

Leaders need to be trained on how to ask the right set of questions and be looking for process safety related issues. Figure 2 illustrates a simple laminated pocket card with questions and situations to observe during a Process Safety site inspection. Providing this type of card will give individuals a quick reminder of process safety topics to focus on during the site inspections. It also provides a standardized approach across the organization so that everyone is asking the same questions and sending the same message, "Process Safety is our top priority."

Figure 2: Example Process Safety Inspection Cards

> **Process Safety Inspection Checklist**
> **Personnel Questions**
>
> - Do you have risks of fire, explosion, toxic or environmental release?
> - Which worries you most?
> - What would be the cause of the incident?
> - Do you think there are adequate safeguards in place?
> - Have you witnessed or been involved in any process safety incidents or near misses?
> - Do your work procedures provide adequate information about process safety risks and their control?

> **Process Safety Inspection Checklist**
> **Observations**
>
> - Are there signs of overflow from tanks or other vessels?
> - Are bunds empty or do they contain chemicals or rainwater?
> - Are vents directed to a safe location?
> - Are there signs of leaks from valves, flanges, pumps?
> - Is equipment in a corroded or damaged condition?
> - Is equipment clearly labelled?
> - Is there alarm overload in the control room?
> - Do flexible hoses appear to be in good condition?

2.2.1 Leadership Actions:

- Perform Process Safety site inspections on a regular basis and set the same minimum expectation from your team.
- Print the Process Safety site inspection cards, in multiple languages if appropriate, and distribute them throughout your organization.

2.3 Effective Communications

Most leaders have already learned how to effectively communicate, but what are you communicating? Are you communicating what is truly important in your underlying message? As a process safety leader, are your words reflecting process safety as a top core value? There are many opportunities in our daily activities to integrate process safety. An email asking your team to reduce costs by 10 percent in the next year should certainly include a discussion on the potential impacts this may have on process safety. Your actions speak volumes and your written words can be reread and forwarded. Likewise, the lack of communications (both written and

unwritten) can have a powerful influence on process safety culture. Leaders must use all available modes of communication to integrate process safety into their day to day activities. Work toward integrating process safety into three activities (e-mail, conversation, business decisions, Process Safety site inspections, etc.) at least three times a day. The impact will be multiplied!

2.3.1 Leadership Actions:

- Include process safety on the agenda for all relevant meetings.
- Encourage an open culture for communicating process safety issues, especially "bad news".
- Lead through incorporating process safety into your daily activities.

2.4   Risk Based Decision Making

Leaders across all business units are making daily decisions reflecting business drivers and manufacturing performance.   Many of these decisions may be affecting process safety performance and business risk. Leaders across the organization must consider the process safety risk they are managing in their role in many different events, including the following examples:

- Budget Setting/Cost Control
- Recruiting (Competencies)
- New Plants
- Deferment of Turnarounds, etc.

Consideration must be given to the management systems or work processes that are in place to manage:

- Process safety risks when making commercial decisions.
- Process safety risks when appointing new plant managers.
- Integrity of process safety investments with cost cutting.
- Process safety impacts from changes to the process or organization.
- Process safety due diligence for mergers, acquisitions and selection of third party tollers.

Leaders should consider what their targets are with respect to the roles they are in when evaluating business decisions such as cost cutting or new product introduction. This is the opportunity to step back and personally challenge themselves on where and how this may impact the integrated process safety program. In many cases, they may need to seek council to help

assess the impacts, such as process safety hazards, availability of process safety information, integrity of safety systems, practices in place, etc.

2.4.1 Leadership Actions
- Manage process safety impacts arising from modifications, changes to organizational structure or changes to the environment (e.g. following loss of corporate function, new or modified processes, downsizing, etc.).
- Incorporate identification of major process safety hazards, availability of process safety information, integrity of safety systems, and practices in place into the due diligence process for mergers, acquisitions and selection of tollers.

2.5 Self-Assessments

Many organizations already encourage, if not require, self-assessments to be performed on a regular basis. Self-assessments are intended to supplement three year compliance audits by evaluating practices in place versus conformance with compliance requirements. Self-assessments provide many benefits including:

- Identification of non-conformance to procedures, policies and regulatory requirements.
- Continuous improvement in process safety programs.
- Alignment of personnel with process safety responsibilities.
- Targeted areas for improvement.
- Prioritization of resources.
- Program sustainability.
- Identification of areas/programs that are functioning.
- Improved process safety culture.

Leaders of an organization must set the performance expectation and desired outcomes of self-assessments. The results should be used to identify areas of improvement to minimize or eliminate repeat findings and management system breakdowns.

2.5.1 Leadership Actions
- Communicate that process safety self-assessments are a minimum expectation and should challenge others to focus on effective control of risk, rather than compliance only.
- Ensure that issues identified are resolved with robust corrective actions.
- Collect enough data to validate that they are taking place.
- Promote and take interest in what sites are finding and best practices that are closing gaps.

- Utilize feedback to make informed mid-course adjustments or re-prioritization.
- Assess health check of administrative and engineered safeguards in place.

2.6   Lesson Learning

Lesson learning is not a new topic of discussion among process safety professionals. There have been many significant incidents that organizations have studied and learned from over the past 30 years. Several organizations have unfortunately been the teachers of these valuable lessons by having monumental catastrophes. Others have studied those catastrophes and realized that a similar incident could happen in their organization. The book "Failure to Learn", by Andrew Hopkins, has provide a wake-up call to countless organizations, leadership teams and process safety individuals that something has to immediately change in the way they are doing business.

Jesse C. Ducommun stated, "It should not be necessary for each generation to rediscover principles of process safety which the generation before discovers. We must learn from the experience of others rather than learn the hard way. We must pass on to the next generation a record of what we have learned."   In a similar manner, it is the leadership of today that has the social responsibility as an organization to study and learn from accidents and near misses.

Everyone has the opportunity to learn from the past. Historically in most organizations, information has been shared versus learned. The key difference is that sharing is the act of talking about something and learning is acquiring knowledge or skill by instruction or study, and applying this new knowledge / skill. Learning leads to action or the modification of a behavior. Process safety leaders must create a learning environment to promote learning from incidents and applying this knowledge across their organization.

Individuals must be trained to collect the <u>right</u> information on incidents that foster learning through "story telling", such as:
- Preserve the evidence, gather "forensic" information and photos, and record testimonials for the inquisitive and illustrative learners.
- Provide technical data/calculations for the detailed engineers.
- Provide a clear description of the hazard scenario from the root cause initiating event and enabling or conditional modifiers to failed or activated safeguards to final harmful event for the Incident Investigators and PHA/LOPA facilitators.
- Provide a summary of lessons learned by those involved in the incident and the investigation.

Create a learning environment in the organization that promotes learning at all levels.
- Promote "story-telling" of past incidents on a regular basis.
- Promote lesson learning from issues across areas of common technology or operating models setting the expectation for proactive risk elimination or prevention.

- Use speculation to engage others in deeper consideration of the process safety aspects of topics being discussed, look beyond the obvious and ask "What If?" or "What could have happened?"

2.6.1 Leadership Action
- Identify Process Safety Best Practices and implement a forum to communicate these activities across your sites.
- Share process safety incident details across the organization and ensure corrective measures are implemented where applicable.

2.7 Active Monitoring and Feedback

Leaders are responsible for identifying important goals and the leading Key Performance Indicators (KPIs) that drive achievement of these goals. Metrics at the site level must be actionable, repeatable and auditable. The desired result is progress toward achieving the goals important to meeting the division and corporate business strategies and objectives. Some of the key concepts are to:
- Establish a metric that reflects status toward achieving each goal (outcome metrics are often lagging).
- Establish dynamic leading metrics whose incremental improvement will directly and positively influence progress on achieving the lagging goal metrics.
- Routinely track progress and provide feedback.
- Reward achievement and start again at the top.

A strong team develops around clear and measurable goals that are understood to be important to achieve at all levels of the organization. Leaders, or "coaches", must identify those leading metrics that are within the influence of their team and will predictably result in achieving the goals. There are many different types available to track leading and lagging metrics. One such approach is to use a coach's scorecard and a player's scorecard.

The concept of a Coach's scorecard is to be data rich and fairly complex in nature. Due to the amount of information on the scorecard, it may take careful study to figure out if the team is winning. The coach's scorecard is used to track the performance of the team and should allow the coach to make mid-course adjustments based on the trends of the data.

A player's scorecard must be clear, simple and available to the team. It should show both leading and lagging measures. Most importantly it should tell the player within five seconds if their team is winning or losing. A player's scorecard is essential to motivating the players to win and can be a powerful device for changing human behavior.

2.7.1 Leadership Actions

- Proactively seek out information relating to process safety and the status of process safety implementation.
- Implement process safety Key Performance Indicators (KPIs) appropriate to the level of risk at sites, including information on the prevalence of deficiencies or dangerous trends which could lead to a major accident.
- Maintain a compelling scorecard.
- Communicate and review the metrics routinely.
- Monitor the trends and manage the results to ensure improvements are being achieved.

X Conclusion

Leaders make business decisions on a regular basis in line with their roles and organization's goals. To make informed risk-based decisions, leaders must understand the thread of process safety that is weaved through the operating model. That starts with an awareness of the hazards present and continues with effort on their part to ask, listen and learn. Active and visible leadership in process safety and the culture that drives will result in business value to the bottom line and, ultimately, a Best in Class Process Safety Program.

X+1. References

[1]   Hopkins, Andrew, "Failure to Learn, the BP Texas City Refinery disaster," CCH Australia Limited. Sydney, Australia. 2010

Additional references not cited:

[2]   CCPS. *Risk Based Process Safety.* Center for Chemical Process Safety and John Wiley & Sons, Inc. Hoboken, NY. 2007