

# Safety Snippet: Three Strategies for Maximizing Worker Engagement in PSM



## Introduction

Many industrial sites struggle to achieve consistently strong business performance in Process Safety Management (PSM). For these work sites, leading indicators may show that there is good participation in process safety activities, but unfortunately the process safety incident rate remains above targets. Oftentimes, these sites must be very reactive as incident follow-up consumes much of their available resources and incident avoidance continues to be elusive.

Fortunately, it is possible to break this trend. However, to do so, changes will be required. An organization cannot simply continue with the same strategy and expect to achieve improved results. Instead, it will take new strategies to unlock worker engagement. This will boost the Process Safety Management Culture which in-turn will yield an improvement in performance.

Three recommended strategies for improving Process Safety Management performance include the following:

1. Using the "swiss cheese model" communication tool
2. Routinely and purposefully sharing high consequence severity incidents
3. Acknowledging and communicating exemplary performance

## Communicating With Swiss Cheese

The swiss cheese model is very simple and hence readily understood at all levels of an organization. It is an excellent tool for communicating with maintenance mechanics and senior leadership alike. All Process Safety Management scenarios can be mapped on a simple swiss cheese model and communicated throughout the organization.

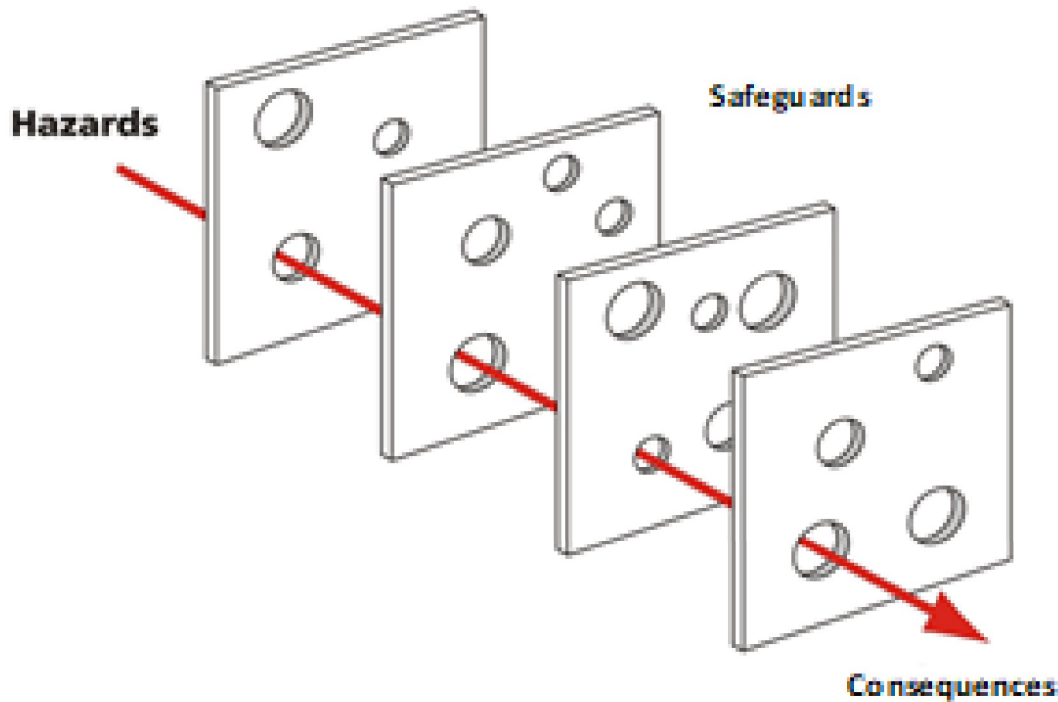
An overlooked, yet key benefit of the swiss cheese model is that it can be used to demonstrate the value of field activities in Process Safety Management. Many organizations do an adequate job communicating why it is important to conduct a quality Process Hazard Analysis (PHA) or quality Management of Change (MOC) reviews. However, organizations often do not communicate the importance of field activities, such as Lock-Out Tagout, Field Safety Audits, Operator Rounds, and Field Verifications in achieving strong Process Safety Management performance. Yet, the swiss cheese model can be used to show that these activities are important safeguards in preventing or mitigating process safety incidents. This can lead to a paradigm shift in thinking for field workers. For example, instead of operators completing operator rounds because they are told to do so, they are now conducting rounds with the purpose of preventing or mitigating Process Safety Management incidents. Just imagine the improved quality of these rounds and the many minor issues that will be caught before they become major issues with this shift in thinking. Employing this strategy is paramount to success, since it is the first-line workers and their supervisors that have the greatest impact on Process Safety Management performance.

## In This Issue

Three strategies for improving Process Safety Management performance are proposed. These strategies can be used to improve Process Safety Management Culture, which in-turn will yield a higher level of performance.

Safety Snippets are published monthly and can be located on the Nebula Safety & Environmental LinkedIn page or website.

<https://www.NebulaSafety.com>



## Sharing What We Hope Never Happens

Nobody ever wants to have a workplace fatality occur, especially not at their site. Fortunately, these high consequence severity incidents do not occur often, and so, many workers have not had to experience the heartache and impact of such incidents firsthand.

However, there is a drawback to not having this experience as unfamiliarity with catastrophic consequences can lead to a lower sense of vulnerability. Workers may think that the safeguards they have are adequate; however, this may be a false sense of security. If not addressed, these inadequate safeguards have the potential to result in a Process Safety Management incident.

The solution is simple, try to learn as much as possible from others that have had catastrophic incidents. Routinely share relevant catastrophic incidents that have occurred in similar processes along with the findings and recommendations. Use the swiss cheese model to indicate the hazards, safeguards, and consequences. Be introspective! Evaluate your own facilities equipment and work practices. Strengthen your safeguards and add new safeguards to prevent similar incidents from happening at your worksite.

Some organizations do not share external events and associated learnings for a variety of reasons; however, not readily sharing these events is missing an opportunity to improve. This is because prior events demonstrate not only the safeguards that failed, but also the cause for why they did not function as intended when called upon. Sharing these details can help workgroups “gameplan” to prevent similar incidents at the worksite. This will also boost the Process Safety Management Culture as workers better understand the impact of their actions on Process Safety Management performance.

Additionally, sharing external incidents helps senior leadership better understand the complexities of Process Safety Management and the importance of their leadership commitment. It can help them make better decisions and more explicitly show their support for Process Safety Management efforts. This will bolster the Process Safety Management Culture.

## Acknowledging and Communicating Performance

We must remind ourselves that the term Process Safety Management does contain the word “Management.” Sometimes we all get too used to using the acronym PSM; however, it must be noted that good management is needed for success in Process Safety Management. Without good management, performance is often lackluster.

One facet of management that can directly benefit Process Safety Management is the importance of recognizing and rewarding workers that have gone “above and beyond” their routine job duties. Examples include:

- Spotting and reporting an incipient leak during operator rounds
- Identifying a controls problem that may have prevented a critical interlock from functioning
- Checking a new installation in the field and finding inconsistencies with the design

These sorts of activities are going “above and beyond” routine job duties because they exhibit strong attention to detail and initiative for change stemming from an understanding of the importance these details can have when it comes to process safety. Also, the outcome of this work contributes to improved performance. Communicating this quality work throughout the organization and the impact on Process Safety Management performance will further strengthen the Process Safety Management Culture. This sets an example of what exceptional looks like!

When communicating the impact, the swiss cheese model should be used so that everyone can clearly understand the impact of what was done. Also, present it as a workgroup accomplishment and reward workers in that group through acknowledgment. This will set an example for other workers and workgroups and will further promote teamwork.

# Shell Norco Explosion (1988)

**Background**

- The ~250,000 BPD Shell Norco Refinery is located near New Orleans, LA
- The refinery has been in operation since 1916 and was purchased by Shell in 1929

**Event**

- A large propane release occurred from the depropanizer overhead line on the Catalytic Cracking Unit (CCU)
- Release was ignited within ~40 seconds, resulting in a strong explosion

**Consequences**


- 7 fatalities and ~50 injuries (personnel and public)
- Explosion destroyed the CCU and other units, disabled site firewater, steam, communication, and the emergency alert systems

**Investigation**

- Pipe failure occurred 44” below an ammonia-water injection point that was installed 5 years earlier to prevent corrosion due to H<sub>2</sub>S, CO<sub>2</sub> and cyanides
- **Incomplete dispersion** of the corrosion inhibitor resulted in an acidic zone at the **outside edges of the spray cone**
- UT measurements at the center of the elbow **did not detect** the localized corrosion “groove”

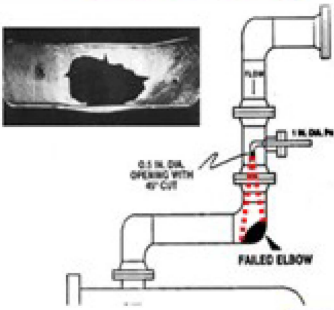
**Learnings**

- Identify and address cases where there is potential for localized corrosion
- Ensure any areas with potential for localized corrosion are thoroughly inspected
- Control ignition sources in the plant



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**Failed 8” Elbow**



0.5 IN. DIA. OPENING WITH 4" CUT

FAILED ELBOW

Reference & AFPM

Nebula Safety and Environmental has experience in fostering a strong Process Safety Management Culture to drive top tier performance. Please reach-out to the Nebula Safety and Environmental Team at [NebulaSafety.com](http://NebulaSafety.com) for additional information.

### References:

1. <https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.crhmro.org%2FCAER%2Fwp-content%2Fuploads%2F2021%2F01%2FShell-Norco-1988.pptx&wdOrigin=BROWSELINK>