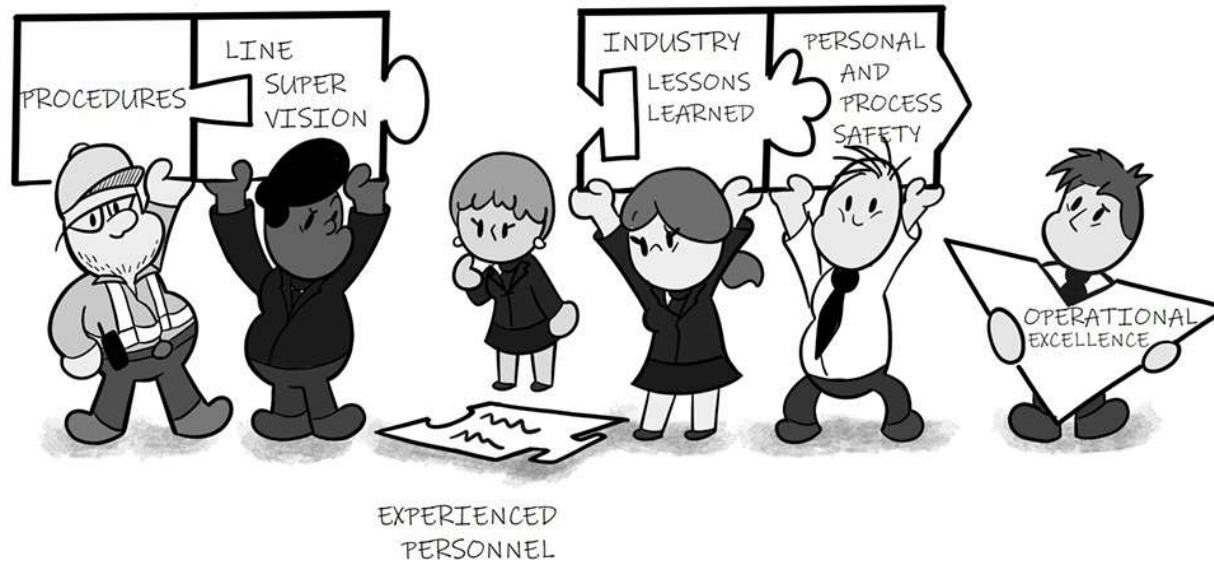




## Operational excellence: Repetitive incidents in the energy business

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Workforce demographics in the oil, gas, chemicals and other energy industries have altered personnel experience ratios. The retirement of highly experienced employees, often encouraged by company retirement packages designed to reduce workforce costs, threatens institutional knowledge in these organizations. According to these industries, lessons learned typically have a 5 yr–10 yr lifespan before past events reoccur. This, coupled with less-experienced employees and leaders, increases the probability of repetitive incidents in the energy industry (**FIG. 1**).



**FIG. 1.** The lack of experienced personnel's impact on operational excellence. Source: Roman Tingle.

The energy business is not a new environment. When an incident occurs, it is almost guaranteed to be a recurring and preventable event. Lessons learned to prevent recurrence are often forgotten or never understood due to lack of time, knowledge or experience.

The importance of operational experience for leadership positions is often overlooked or minimized to provide opportunities to less-experienced candidates or develop high-potential personnel. In many cases, true operational experience is difficult to find and therefore may be considered less important than other goals. The lack of operational expertise in any position can be overcome if operational experience exists in the organization above and below the inexperienced leader to advise their decisions. If multiple layers in an organization lack deep operating experience, the organization is at an increased risk of repetitive incidents.

As businesses attempt to be more competitive (especially in economically challenging times), it is typical to see cost-cutting efforts, including voluntary retirement programs (VRPs). These programs are often executed across the whole organization rather than developing targeted programs, which may be more appropriate and result in more manageable experience losses. Typically, those with the most operating

experience are the first to sign up for these VRPs, severely and negatively impacting the company's institutional knowledge.

Unfortunately, significant incidents or near-misses are common after many experienced employees have departed due to VRPs. These incidents often have common factors that may be erroneously identified as root causes:

- The individual involved had insufficient knowledge or training to complete the task safely
- The individual involved forgot one or more critical steps or safeguards
- The individual involved was rushing due to increased workload or to complete the task before the end of the workday.

These factors are strong indicators that the procedures are inadequately detailed, too long or of little value to the user. Frequently, time-tested procedures are considered optional, and appropriately experienced leaders are not always in the work environment auditing procedures and providing the proper consequences/reinforcements for their use. Management systems for developing and maintaining high-quality procedures and developing a strong procedure-use culture should be examined to identify the root causes.

Many events result from frequent shortcuts and critical missed steps—this is often due to the lack of understanding that the critical steps were added to the task to prevent an incident from recurring. When such risks are taken, it is only a matter of time before an event occurs. In many facilities, it is common to find that frequent tasks do not require a procedure. However, in the airline and nuclear power industries, no matter how often a takeoff, landing or task within a plant is performed, a checklist is utilized to guarantee no critical steps are missed. For example, the landing gear must be down before approaching the runway. To achieve optimum efficiency, safety and productivity, the energy industry must match the safety performance of the airline and nuclear power businesses.

However, line managers typically have full schedules without much time to “walk the talk.” Questions to consider include:

- How often do you get out to visit your technicians while they are conducting critical operations?
- Do you observe the use of procedures and checklists for all operational tasks and maintenance repairs?

- How do you respond when no procedure or checklist is available to review during these critical operations and maintenance repairs?
- Have you reviewed a procedure or checklist at a job site to verify that the critical steps have been taken? Do you have the institutional knowledge and experience to make this evaluation?
- How do you reinforce the use or lack of use of procedures and checklists when you are at a job site? Can you provoke emotion to impact future outcomes? How do you reinforce individuals who have gone the extra mile to execute the procedures with excellence?
- Do you tour with direct reports to gain leverage by tailoring the reports to reflect what is critical to you regarding operational excellence in all parts of the business?
- If you do not know the details, are you comfortable asking for clarification or engaging expert support to understand the task better?
- Have you properly captured institutional knowledge and industry lessons learned in your procedures to prevent the recurrence of serious incidents? How do you capture industry lessons learned? Are key hazards and precautions identified and highlighted within procedures and checklists?
- When getting into the details, how do you justify due diligence in your observations? Can you explain the “Swiss-cheese” model that describes the barriers you have installed to prevent future failures (**FIG. 2**)?
- How do you explain why attention to detail is critical to excellent/safe operations and develop discipline throughout the enterprise?
- Is it clear that if you do not address all areas that do not align with operational excellence, you are endorsing a substandard performance level?

# Process Safety Event - Swiss Cheese Model & Sample Barriers

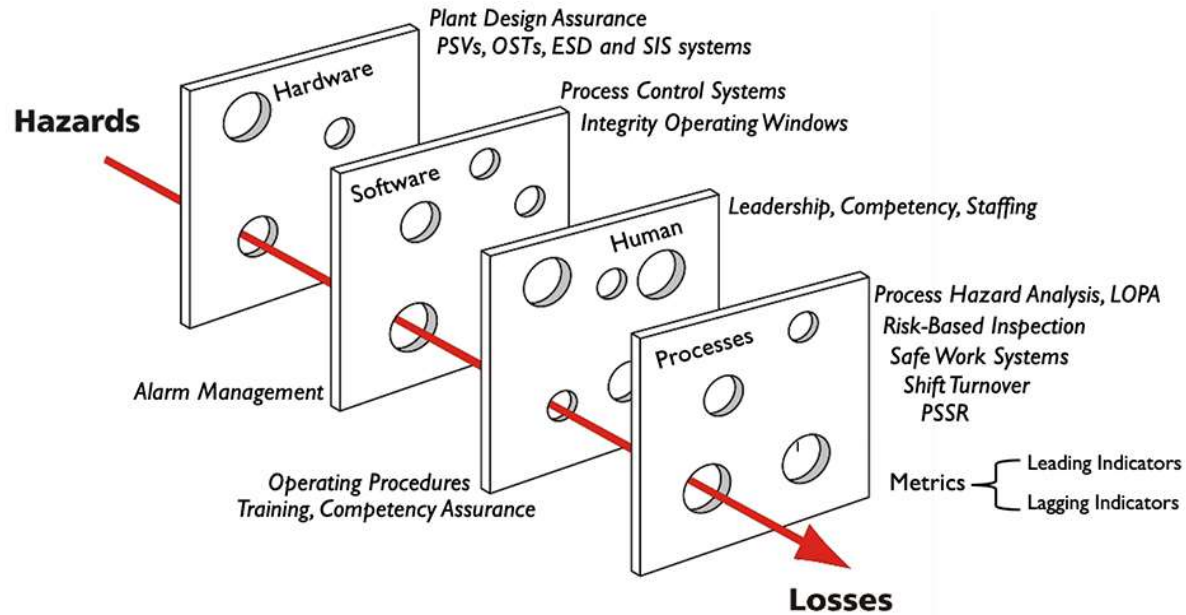


FIG. 2. Swiss-cheese model. Source: JEM Advisers.

This series of questions is intended to increase the understanding of leadership's need to have operational experience in the areas they are responsible for.

Some managers rely on safety staff to guarantee safe performance, but this has proven to be a failed model. If the safety staff do not have the necessary operational experience, they cannot provide the knowledge necessary to guarantee operational excellence. Operational excellence and personal and process safety are all line responsibilities and cannot be delegated to staff organizations.

If governmental agencies are relied on to validate safe operations, their auditors often do not have the required operational experience to recognize all hazards. It is not unusual for experienced third-party auditors to review operations that have recently received a regulatory compliance audit and find that several issues that have resulted in significant events to the energy industry are still in play.

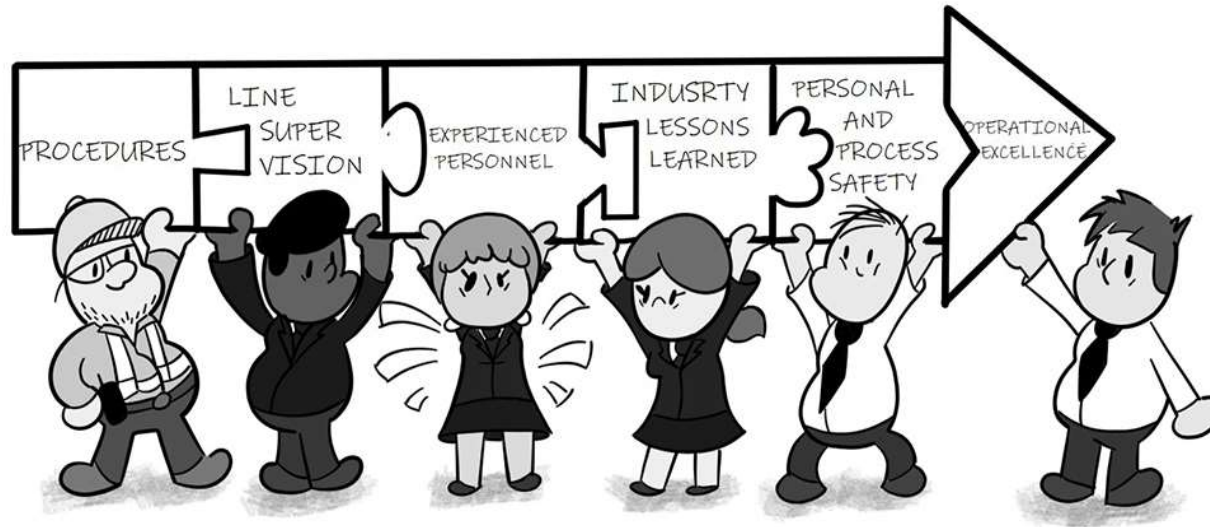
**How do smaller companies capture and maintain these industry lessons learned?** Do smaller companies participate in industry forums like the American Petroleum Institute (API) operating practices committee that openly share past events with their lessons learned to prevent recurrence? How do organizations avoid back-sliding from the key steps and actions intended to prevent event recurrence?

Unfortunately, lessons learned to prevent future failures in facility design are being ignored or forgotten. Designs and construction methods known by the industry to potentially cause incidents are frequently seen in new projects to cut costs in the initial design and build.

For example, it is not unusual to see a facility modified to strengthen small-bore piping by removing long nipples and bridge welding the connections up to the first valve to see the new construction adding back these liabilities that have caused past events:

- Flangeless valves are making a comeback to cut the cost of two flanges, once again adding the liability of a small pool fire turning into a major event when the long bolts relax.
- Once again, nitrogen connections are installed with the same quick disconnects as utility air.

The list is extensive and continues to grow. This tide of bad decisions can only be addressed by engaging key players with the appropriate operating experience level in project design early in the design process. This is one of the key areas that can be addressed with robust operational readiness assessments at the appropriate times during project design and construction (**FIG. 3**).



**FIG. 3.** Operational excellence objective. Source: Roman Tingle.

It is vital to remember that almost all incidents are people-driven or caused by human error. However, the right people—those with experience, training and the willingness to engage and mentor—can stem the tide of ever-increasing incidents in the industry.

Some major energy companies have realized that a lack of succession planning has resulted in vast shortfalls of capability and competence within their workforce. To combat this issue, they have introduced structured processes to ensure nominated successors are in place for each critical role within the organization with the appropriate knowledge and skill set. The human resource team typically develops and leads these processes, with vital input (and decision rights) from operations management. **HP**

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