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Safety and environmental management in the oil and gas industry

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**A new model
to enable line
performance**



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Executive summary



From a safety and environmental (S&E) perspective, large process industry companies have made huge strides in the last decade. Thanks to more rigorous guidelines, an increasing emphasis on personal and process safety programs, and better risk management practices, S&E performance is far better now than it used to be. Yet the ultimate goal — “zero harm” levels of performance — has remained out of reach in most sectors, as S&E performance has plateaued in recent years.

Part of the problem is the focus on functional activities, and the benign neglect of the interface between S&E and the front line. The usual approach is to assign S&E advisors to frontline work sites, and give those advisors a broad and poorly defined mandate to “support day-to-day S&E activities.” This has led to a sharp drop in injuries and fatalities in the last 10 years. But the ambiguity in this approach also leads to duplication and a “do it for me” attitude, and opens the door to a sometimes confusing stream of new initiatives and procedures.

We believe companies can take the next big step forward in their S&E performance if they consider a paradigm change, moving to an entirely new model. In this model, accountability for day-to-day S&E performance shifts to the front line, redefining the role of the central S&E function and eliminating the overlap that may once have been justified but has become an obstacle to future progress. For this to happen, frontline workers need to understand their new responsibility and develop the capabilities to fulfill it. Where a capability is missing, the role of S&E advisors is to help build that capability, not substitute for it. A structured approach, beginning with a self-assessment and a clear statement of the ideal end-state organization, can help companies make the move to this powerful new model.

S&E's evolution: Something has to give

In recent years, oil and gas companies have made sizable investments in their safety and environmental (S&E) functions. These investments have made the companies' S&E systems more sophisticated, and have enabled the companies to become much more ambitious in their safety goals. Indeed, it's not unusual for oil and gas companies nowadays to aspire to zero injuries and fatalities. For most companies, however, this goal has remained elusive. Even if fatalities only happen at a fifth or a tenth the rate of 20 years ago, they still happen. For CEOs and boards, the question is how to make real additional progress, now that many of the most obvious initial steps have been taken.

In an economic climate that isn't sympathetic to investments in non-revenue-producing functions, the answer has been predictable: S&E leaders have been asked to find ways to be more effective without any increase in resources (and sometimes with fewer resources). But in our judgment, "Do more with less" isn't the right advice for the workplace safety function. Instead, we believe S&E management needs to be fundamentally rethought.

Recent improvements

In the industries where S&E performance is most pressing, there has been significant progress in the last decade. For instance, in oil and gas, the total recordable injury rate decreased from 4.00 per 100 workers in 2003 to 1.74 in 2012. Over the same period, the fatal accident rate in the industry was cut by more than half, from 4.94 for every 100 million hours worked to 2.38. There have also been big improvements in the chemicals industry, thanks in part to the Responsible Care Initiative; companies that are part of this initiative, which pushes for better health, safety, and environmental (HSE) practices, have reduced their recordable injury and illness incidence rates by 79 percent since 1990.

These improvements have resulted from efforts in four areas. To begin with, most companies have instituted a more ambitious set of *guiding principles and concepts*. The idea of a workplace in which the safety

“Do more with less” isn’t the right advice for the workplace safety function; S&E management needs to be fundamentally rethought.

record is perfect and injuries don't happen is perhaps the most obvious example of how — by setting the bar high — a principle can help. Companies have also taken steps to embed a culture of safety in their operations, prompting employees to move beyond mere “compliance” and take responsibility for identifying and mitigating hazards and risks. It's also much more common now for companies to be explicit about their safety strategies: to lay out what they want to achieve and how they want to achieve it.

To support these high-level principles and concepts, most companies have introduced safety-related *programs and systems*. For instance, a program might focus on changing the protocol for transporting flammable liquids within a manufacturing plant (a process safety issue), or on a requirement to wear protective equipment (a behavior-based safety issue). These are both highly organized programs. Other programs are more tactical, and take the form of regular toolbox talks or “Take Five” review sessions at the job site. Companies have also introduced new management systems and put in place more sophisticated IT systems for data recording and analysis.

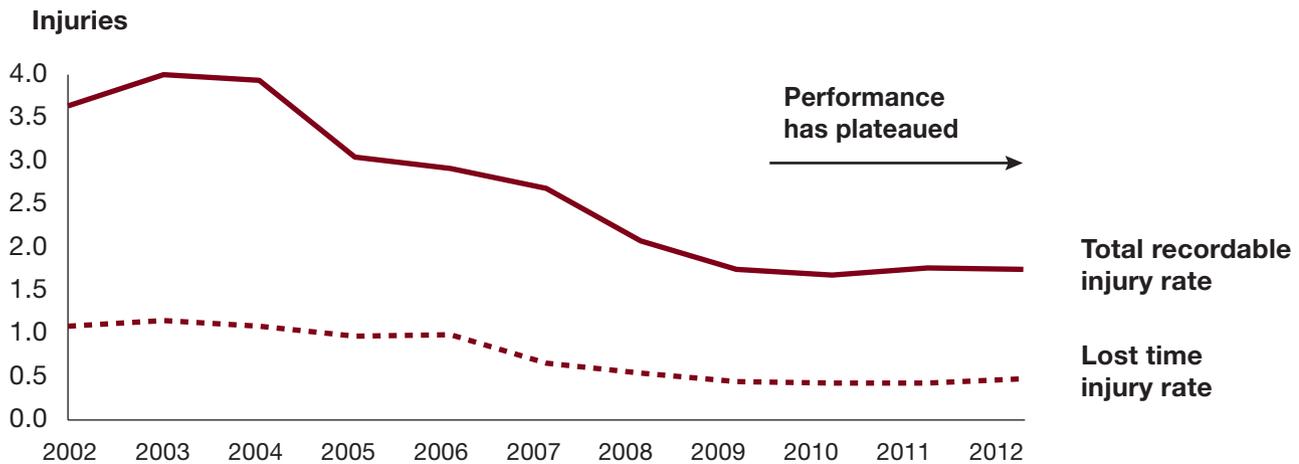
The third area of improvement is in *reporting and key performance indicators (KPIs)*. In particular, companies have started using far more detailed indicators, and offering multiple views of safety performance — by asset, business, or geography, for instance. Likewise, the list of KPIs has expanded; companies are looking not just at fatalities, greenhouse gas emissions, and working days lost but at more nuanced metrics, such as the frequency of injuries resulting in lost time, and more forward-looking metrics such as “near misses.”

The fourth big corporate improvement effort in S&E has been in the area of *risk management*. Companies have put in place more rigorous, comprehensive risk management frameworks and have embedded risk management in every aspect of their operations. This deliberate inclusion of risk management as part of the work-planning phase helps ensure that safety and environmental considerations are built into the task ahead of execution and that at least some thought is given to appropriate risk mitigation.

Shifting the locus of S&E

Despite the positive impact of these activities, safety performance as measured by on-the-job injuries has plateaued in recent years, after more than a half decade of improvement (see Exhibit 1). To be sure, companies could continue to focus on the four S&E improvement areas — guiding principles and concepts, programs and systems, reporting and KPIs, and risk management — and they might well get some additional incremental performance improvement. But these efforts are reaching their natural limit and are unlikely to lead to the

Exhibit 1
After years of improvement, S&E performance has recently plateaued



Note: Total recordable injury rate is the number of recordable injuries (fatalities, lost workday cases, restricted workday cases, and medical treatment cases) per million hours worked. Lost time injury frequency is the number of lost time injuries (fatalities and lost workday cases) per million hours worked.

Source: International Association of Oil & Gas Producers safety performance indicators, 2012 data; Strategy& analysis

step change that most companies are looking for in S&E. Which leads to the question: What do companies do next?

Our perspective is that a paradigm shift is now required, building on the improvements to date but shifting focus from the function to an interface that has probably been least examined, the “coal face,” or front line, of businesses. By this, we mean the part of the business where workers are directly involved in operations (that is, where the work actually gets done). Overall, we believe a step-change improvement in functional delivery across this interface will enable the next step change in line S&E performance. We have investigated this aspect of the S&E operating model for a number of companies, and have been struck, without exception, by the opportunities we have seen.

Three problems tend to crop up, and they are not mutually exclusive. The first is when companies have no clear model for defining the role of the front line and the role of the HSE function, and no consistent approach to how the two should work together. This leads to a number of issues, including highly complex and confusing organizational models at the site level. In other situations, the lack of an agreed-on model leads everyone at a site to cede S&E accountability to the HSE advisors, as opposed to the frontline workers.

The second typical problem is the wide variety of determinants of site-level resourcing. Some companies follow no discernible pattern at all, some use industry benchmarks to determine how many S&E people to deploy, and some link the number of safety advisors to the hazard level (the higher the hazard, the more sizable the on-site S&E staff).

The third problem in S&E is the duplication of activities across the HSE organization. This leads, at a minimum, to a lot of waste and unnecessary cost. But it can also backfire if line workers feel overwhelmed by the amount of input they’re getting, or by the flood of ideas, however good the ideas are individually. Amid all the safety programs, safety tools, and safety guidance memos (often from back-office staffers to whom they are answerable), frontline workers may not know where to begin.

Redefining roles and adding capabilities

There is a better way to move forward. By ensuring that their front line has a high degree of internal competence in S&E, companies can avoid a lot of dysfunction — and make a step change in safety performance. However, to get to this new model, companies need to drive change in two areas. First, they need to be clear about accountabilities. There are three categories of employees whose new responsibilities should be spelled out:

- *Frontline workers*, who are directly involved in operating the revenue-generating asset
- *S&E advisors*, who are assigned to (and co-located at) work sites
- *Central S&E staff*, who coordinate safety and environmental issues across the entire organization

In the model we advocate, the frontline workers alone are responsible for ensuring safety — the advisors don't play a role in this task. Instead, the advisors' job is to coach, provide guidance, and drive continuous improvement. The job of the central S&E staff is to stay on top of regulations and develop best practices, and be an expert resource for the S&E advisors. Ideally, many such experts can be located on-site, close to operations. But in a world of scarce resources, we often find that companies are reluctant to distribute their central S&E expert resources because this scarce asset becomes monopolized — and underused — by one location, leaving the rest of the organization in deficit. Proactive networks — in which S&E professionals share experiences and expertise across the organization — solve this problem, but they have to be carefully established and diligently managed.

The second change, necessary for the first to work, involves building new capabilities. This means giving frontline workers (at all levels, not just management) the tools and training necessary to execute S&E activities as an integrated part of their daily work. Within S&E, it means developing credible, experienced, independent advisors who

understand how to coach the frontline workers and how to get them to challenge their own assumptions. This takes some doing. Typically, those in S&E either have spent their whole careers in the function (in which case they have only a limited knowledge of operations) or are long-tenured operations people who have been transferred to S&E at a late stage of their careers, without a great deal of functional knowledge. Either way, there are gaps to fill.

Changing the model: A five-step process

To make the substantial changes that are involved in moving to the new model, companies need to work through a number of challenges, related to both organizational structure and human capital development (see *Exhibit 2, next page*). A step-by-step approach, illuminated by actual case examples, follows below. (We have aggregated the several companies involved in our case studies into a single oil and gas company here, for ease of example.)

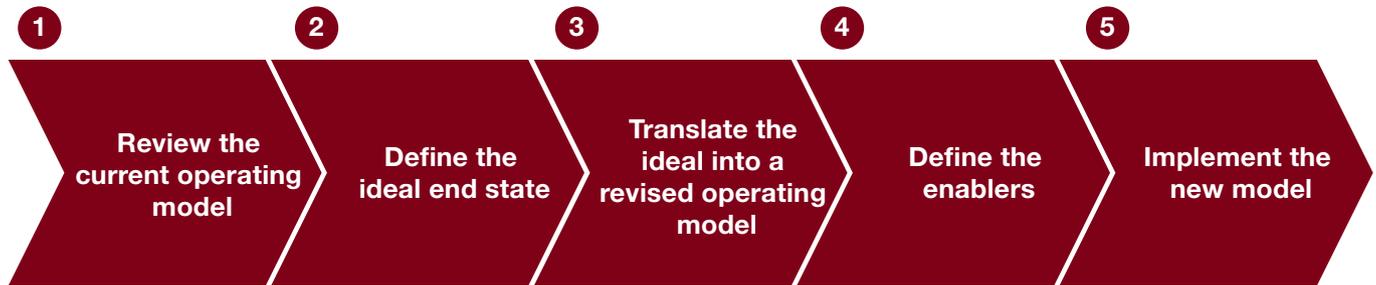
1. Review the current operating model, focusing on resources and capabilities. This starts with understanding how the S&E imperative is currently being satisfied — the operating philosophy. What is the function, at a high level, set up to do?

When an oil and gas company underwent this assessment, it found that its approach to S&E was built around compliance — that was its “mental model” — and a lot of energy went into enforcing prescribed behaviors and “auditing” S&E practices at job sites. This had clear implications for how the company allocated resources, and for the capabilities of its frontline workers, S&E advisors, and central S&E staff. Among other things, this approach meant that there were many S&E advisors at virtually all work sites, making sure frontline workers were following safety practices and correcting violations. The S&E advisors didn’t have particular safety expertise; they just had to be familiar enough with the prescribed practices to recognize when those practices weren’t being followed. With the S&E advisors playing this role, the front line didn’t think of itself as responsible for safety. As for the corporate S&E staff, it was spending most of its time generating the policies and procedures — the rule book — that its on-site advisors were enforcing.

For some companies, this approach is sufficient. In fact, when a company’s S&E performance is below average, as this company’s performance was, close supervision of S&E practices can make a lot of sense. By pouring resources into compliance, a company can get to an acceptable safety level. But this is an early stage of S&E evolution — it is expensive to maintain, and it cannot put a company on the road toward zero incidents. To have a chance at that, the oil company needed to adopt a new mental model.

Exhibit 2

A five-step process for improving the S&E operating model



Source: Strategy&

2. Define the ideal end state, based on needs and overall aspiration.

In this step, a company maps out its ideal S&E model. Among the questions to be answered: What role should the central S&E staff and S&E advisors play? In what ways should the advisors support the front line, and in what areas should the front line operate on its own?

At the oil and gas company, the answer to at least one of these high-level questions was clear. The company wanted the S&E advisors to move away from their enforcement roles and focus on continuous improvement. This wouldn't mean pulling S&E advisors away from the front line — at least not altogether. But it would mean transitioning the advisors to “partner” and “teacher” roles, and reducing the time they spent checking up on operations and performing other supervisory tasks. The goal was to improve safety performance; the mechanism was shifting responsibility for day-to-day S&E activities to the front line. If this allowed the company to operate with a reduced number of S&E advisors, that was seen as a nice by-product of the change, but it was a strictly secondary benefit.

3. Translate the ideal into a revised operating model. The next step for a company is to consider its ideal end state in the context of what's feasible, and start pushing toward that. The considerations include who to put in which positions, which capabilities to develop, how to allocate resources, whether to dedicate or share S&E resources, how to structure reporting lines to support the new goals of both the front line and the central function, and how to avoid duplication.

The oil and gas company we encountered believed it would help if both the front line and S&E function had input into the discussion. So the company held workshops with representatives from both sides. A key question was defining the role that the corporate S&E function should have. One argument called for limiting it to pure policy development; the other called for a combination of policy development, dedicated support, and a pool of expert resources. After some discussion, the company decided on the “policy, support, and expertise” role for the corporate function and then moved on to create the new organizational model, including roles and responsibilities, reporting lines, team structures, ranges of resources, and a responsibility assignment matrix.

4. Define the enablers. Companies don’t move easily to new models; they are prone to inertia. If the S&E model is to change, the right enablers must be employed.

The oil and gas company used several enablers, notably leadership behaviors, decision rights, capability development, knowledge networks, and line/function rotation. The leadership behaviors — such as the introduction of safety days, when plant operations would be shut down — underscored that S&E was a company-wide priority. The decision rights made it easier for the central S&E function to get the right people in the right positions. Capability development (in the form of training, setting expectations, and defining career paths) put the company in a position where it could start to think about S&E differently. The knowledge networks gave those on the front line a way of sharing concerns, what they learned, and best practices as their S&E responsibilities grew. Finally, the job rotation helped the function gain a better understanding of the front line, and vice versa. It went a long way toward closing a capability gap that existed at a company in which most S&E advisors had never held an operating role.

5. Implement the new model. By its nature, shifting the responsibility for daily S&E activities to the front line isn’t a flip-the-switch endeavor. A company with scores of work sites may have many different operating philosophies, and many different S&E advisor ratios.

This was the case at the oil and gas company. The approach to S&E was very different at one European work site and another in the same market, and entirely different in Africa. As a result, the implementation plans for these sites had to be developed individually. Using what the company knew — and what it learned during a discovery phase — the project teams set a plan for what should happen where, when it should happen, and how long it should take. The work was prioritized based both on the magnitude of different sites’ safety issues and on the likelihood of achieving visible, momentum-building successes.

Benefits of a changed model

In getting the S&E operating model right, the oil and gas company has started to put itself in a position where it not only can achieve a level of safety performance on par with its industry but can also begin to approach the ideal of zero injuries. It has put the onus for S&E performance where it belongs — on the managers who already have credibility and the trust of their staffs because of their operational experience. At the same time, the company is allowing the S&E function to develop its regulatory and subject-matter expertise, so that it can pursue the valuable mission of continuous performance improvement, and pull back on its role as a stand-in safety officer.

Conclusion

During the past two decades, industrial, chemicals, and oil and gas companies have made huge strides in their S&E practices and outcomes, but the pace of improvement has stalled in recent years. Environmental mishaps, serious injuries, and fatalities have become rarer, but there is wide consensus that even one is too many — and can undermine a company's fortunes for months or even years.

At best, many companies today are on track to make incremental improvements by tweaking the S&E models they already have in place. We suggest they consider a paradigm change, moving to an entirely new model that shifts accountability for day-to-day S&E performance to the front line, redefines the role of the central S&E function, and eliminates an overlap between S&E and operations that may once have been justified but has become an obstacle to future progress. We are encouraged by the potential of this paradigm shift and believe that the new path will unlock significant further improvement steps again in the future.

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