



# CUSTOMER SUCCESS STORIES

Advancing Operational Excellence  
through Risk Assessment for Process Safety



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Integration with Management of Change



## Anadarko

### Anadarko Raises Deepwater Drilling Hazard Assessments to Ensure SEMS Compliance, Enable Sustainable Growth

Anadarko Petroleum Corporation is among the world's largest independent oil and natural gas exploration and production companies, with 2.56 billion barrels of oil equivalent in proved reserves at year-end 2012. The company has operations throughout the United States – with onshore assets in the Rocky Mountains region, the southern U.S. and the Appalachian Basin – and is well known for its successful deepwater operations in the Gulf of Mexico and Internationally.

Anadarko is widely recognized for its innovation and commitment to delivering energy resources to the market in a manner that protects the safety of its employees and the communities where it operates. The company's strong culture of bottom-up employee involvement ensures that Anadarko's commitment to safety is carried out daily at all levels of the organization, throughout its operations.

And yet, in 2010, all energy companies with deepwater operations in the Gulf of Mexico – including Anadarko – were deeply affected by the tragic Deepwater Horizon events at a mobile offshore drilling unit that killed 11 workers and injured 16 others. As a result, U.S. officials imposed a six-month moratorium on deepwater drilling operations across the Gulf of Mexico. In addition, federal authorities, citing the need to improve safety during offshore drilling operations, mandated adoption of Safety and Environmental Management Systems (SEMS).

“One requirement of SEMS is a formalized hazard identification process,” said Anadarko Senior Drilling Engineer Advisor Nancy Seiler. “We previously relied on an informal process for hazard identification. Now we needed a system that would formalize that process. And we only had until Nov. 15, 2011 to get an operational SEMS-compliant system in place so we could reconvene drilling operations in the deepwater Gulf of Mexico.”

A SEMS program is designed to help operators identify and manage operational hazards and impacts, with the goal of promoting safety and environmental protection. It requires companies to perform hazard assessments prior to initiating drilling and during execution to identify, assess, mitigate and communicate operational and environmental, health and safety (EHS) hazards and risks.

#### CHALLENGE

- Comply with new U.S. regulatory requirement to support Safety and Environmental Management System (SEMS)
- Streamline drilling permit application process and simplify management of change
- Minimize operational disruption and delays due to replacement of experienced staff

#### SOLUTION

##### Operational Risk

- Process Hazard Analysis (PHA)
- Management of Change

#### RESULTS

- Formalized and standardized proven hazard assessment work processes to ensure full compliance with SEMS regulations
- Tailored industry best-practice template for hazard assessments to fit drilling operations
- Modified permit application process and supporting steps so they are now routinely completed in 1 day vs. 3 weeks for many competitors
- Avoided disruption due to loss of experienced staff and need to train replacements with template that preserves/shares knowledge
- Established model process and system for hazard assessment process that is now being considered for adoption enterprise-wide

# Anadarko Raises Deepwater Drilling Hazard Assessments

Anadarko set out to ensure compliance with SEMS standards and additional safety measures through its Anadarko Management System (AMS). To meet the hazard analyses requirements of SEMS and AMS, Anadarko assigned a team of experts to identify, acquire and implement an enterprise-level software solution that would provide the information framework for hazard assessments. Specifically, the team sought a fit-for-purpose system that is Web-based, and therefore readily accessible to engineers in multiple locations, as well as user-friendly so Drilling specialists stay focused on data and work processes rather than software management.

After a detailed evaluation of the leading products, Anadarko selected Sphera's *Stature*® software, part of the Sphera Operational Risk Solution. Anadarko's evaluators selected the Sphera system because it had both the capabilities and flexibility the company needed. Sphera services experts worked closely with Anadarko stakeholders to fine-tune the software's hazard template for use in deepwater Drilling and Completion operations in the Gulf of Mexico. Together, the team captured and documented Anadarko's best practices in a standard template that parallels each phase of an operation.

As a result, Anadarko is now successfully using the Sphera system to meet SEMS and AMS requirements, while also gaining a competitive edge that quickly caught the attention of other operators. When required, Anadarko has attained swift government approval of permit applications and streamlines completion of other required steps — including peer review of proposed operational plans and procedures, as well as preliminary meetings where rig personnel and other external stakeholders examine the “drilling the well on paper” or DWOP pre-plan.

“That’s the biggest improvement that we’ve seen,” Seiler said. “Now we can get a modified permit approved within a day. Some of our peer operators have actually asked us, ‘How did you get that done so fast? We’ve been working on this project for three weeks and we still don’t have a package ready to submit.’”

“When something happens during the operation that requires a deviation from the well plan, we just check the hazard analysis records in the system. That’s a required step for any management of change and now we can get it done very quickly by returning to the templates and simply adding new information as needed.”

While Anadarko's adoption of *Stature* was driven initially by the need to ensure compliance with SEMS regulations, use of the system quickly began to pay dividends on other fronts, too. Another business challenge that confronted operators following the Deepwater Horizon event was the negative impact that it had on their regional workforce.

“During the moratorium, many experienced industry personnel went overseas,” Seiler said. “Our team had more than 600 years of combined experience among a very small group of people prior to Deepwater Horizon, so we needed a way to rapidly bring additional staff up the learning curve.”

Anadarko successfully met this human resource challenge by leveraging the standard templates within their *Stature* solution as a teaching tool to help new employees gain experience more quickly as well as smoothing transitions for workers who transferred from another company or one job or location to another.

Additionally, metrics for incident severity and probability were calculated for drilling and completion operations based on the Anadarko corporate matrix.

“This strategy of continually incorporating best practices and lessons learned in support of our operations in the Gulf of Mexico contributes to our remarkable culture,” said Sanseeahray (Sans) Burnett, senior EHS/Risk representative for Anadarko's compliance regulatory affairs group. “Other groups across Anadarko are looking at this standardized hazard analysis process as a model they can replicate to promote continual operational excellence.”

“Anadarko's first priority as a company has always been to operate safely and responsibly,” concluded Seiler. “I’m excited because the Sphera solution is helping us clarify our language and quantify the hazards we face so we can work together more effectively to drive sustainable growth.”

“Now we can get a modified permit approved within a day. Some of our peer operators have actually asked us, ‘How did you get that done so fast? We’ve been working on this for three weeks and we still don’t have a package ready to submit.’”

Nancy Seiler,  
Senior Drilling Engineer Advisor  
Anadarko Petroleum



## BASF

### BASF Streamlines Plant Safety Processes Across Global Operations with Standardized Risk Assessments

BASF is the world's largest chemical producer with 2014 sales approaching €75 billion. Its operating principal is to combine economic success with environmental protection and social responsibility. As a result, this German-based company is highly focused on the need for its operations around the world to follow strict, well-defined processes that ensure plant and worker safety as well as protecting nearby communities and ecosystems.<sup>1</sup>

A few years ago, as part of its commitment to continuous improvement, BASF embarked on a project to streamline the documentation and management of risks associated with Safety, Health & Environment (SHE). Company leaders realized that there was room for improvement in their current systems and processes. Plants were using Word, Excel or specialized desktop software to document process hazards. This led to inconsistencies in documentation across the global organization – with staff members using different languages for classification and different methods for HAZOP assessments and data collection. This lack of consistency meant that BASF managers had limited visibility across facilities and were hindered in trying to do comparisons of issues and safeguards. Any comparisons had to be done 'intellectually', by experienced staff reviewing documents that were up to 300 pages long, which was inefficient, time consuming and labor intensive.

"We needed to find a way to create a disciplined methodology for our staff worldwide, so they could use a unified, standardized, and harmonized process for their daily work and ensure that action items were easier to track," said Claus Witte, Senior Process Safety Manager at BASF. Company leaders decided to tackle this challenge by taking a holistic approach. They chose to implement a global, web-based, risk software solution – Sphera® Stature®.

#### Starting Strong with Training and Teamwork

Even in its early stages, BASF's project has already achieved impressive results. To provide managers with greater visibility across the company's global operations, the company needed its widely disbursed workforce to use a uniform process hazard analysis (PHA) template. Within the first nine months of implementation, BASF successfully trained 1,600 staff members across Europe, Asia, and the Americas to use the Stature system. Staffs in all locations now enter data into a single template that uses standardized language and measurements.

#### CHALLENGE

- Inconsistent implementation of a well defined process to manage plant risks
- Inconsistent safety process documentation across the global organization
- Inefficient processes to extract, prioritize and track action items related to Process Hazard Assessments
- Lack of visibility across the global organization limited the ability to improve safety processes

#### SOLUTION

##### Risk Assessment

- Process Hazard Analysis (PHA)
- Action item tracking

#### RESULTS

- Improved consistency in following the well-defined risk management process
- Developed and implemented a global standard template to document process safety risks:
  - Trained 1,600 staff within 9 months
  - Created 1000s of risk assessments
- Increased efficiency in managing and prioritizing action items
- Gained visibility on site risk profiles and status of items to prioritize work load
- Streamlined compliance reporting processes delivering greater transparency and auditability
- Improved on-boarding process for newly acquired companies and simplified knowledge transfer

# BASF Streamlines Plant Safety Processes Worldwide

"I believe one of the successes of the adoption rate for this project was that it was setup globally from Day One and that it was supported by the Steering Committee board", said Witte, "I think another important element was the great team that headed the project. The team was selected in a way that we had different work streams, and each work stream was headed by a colleague from a different region or major site. They had an opportunity to contribute to the creation of relevant templates, they had a chance to shape the future a little bit. That made a big difference. Effective communication, a good team and a global setup were what made it successful".

## Gaining Visibility into Status and Actions

If you can see something, you can measure it and improve it. With a few thousand risk studies now in the system, BASF is starting to build a central risk knowledge base and gain better visibility across the organization. Managers can now see the status of items and prioritize work load for the next few years.

"The system gives you a good idea where you stand in a specific area in a specific plant; what workload you have to expect, due dates for revalidations and so on," said Witte. "It's now easy to drill down to a certain level in the plant and see what is the status at that part of the plant or how many high risks do they have at that site. That is a major benefit and we are just learning. We see big possibilities going forward."

In addition, BASF is now able to more effectively manage action items. "Previously, because we were working with Word, it wasn't easy to extract all of the open issues out of a document", stated Witte, "This was always painful work; you had to copy it to Excel and prepare it for further analysis. Now we use the Stature workflow engine and we can easily see and manage action items coming out of clean sheet reviews. It also gives us the opportunity to analyze our results in relation to some KPIs, which is very valuable for management."

## Enabling Benchmarking, Compliance, Growth

Every five years, BASF revalidates whether it has captured all risk factors for a given process in a plant process safety concept, and every 10 years a detailed implementation check by review of detailed plant documents is performed. BASF previously used a single consolidated Excel list of all steps necessary for revalidation at each production site but the process was complex and cumbersome. With Stature, the BASF team has been able to simplify and improve the accuracy of the revalidation process. The system facilitates the revalidation process, setting all necessary dates and giving BASF staff an overview of plans and dates. They now

know in advance what resources they will need in the coming year so they can allocate appropriately.

BASF made further efficiency gains in the ways that it meets SHE regulatory compliance requirements. "Compliance obligations vary depending on the region a plant operates." Witte explained, "For some of our plants in the US we have some very detailed reports that we need to produce and provide to the authorities. Before, staff had to extract data from Word into a database, then correct and reformat it prior to producing the final report for the authorities. Now with Stature, this is much easier and more efficient. We can quickly extract information such as 'How many open items', 'How many are in process', 'How many A, B or C risks' These kinds of KPIs are important and now at our fingertips. It also makes audits much easier, now we have all the steps documented and the history of the related approvals all within the system."

Over the past decade, BASF has made numerous acquisitions. Now, when it on-boards a new company, the learning curve is reduced in terms of process safety procedures. New colleagues can now review existing process safety templates for similar plants and very quickly understand the structure and workflows of BASF requirements without having to manually peruse hundreds of pages of guidelines.

"To move forward, you need to know where you stand. Stature now is starting to provide that visibility for us, now I believe we have a chance to really understand how we can streamline our safety processes... Ultimately improve the business."

Claus Witte, Senior Consultant,  
Global Process Safety, BASF

## Driving Continuous Improvement

"To move forward you need to know where you stand," said Witte, "Stature now is starting to provide that visibility for us, now I believe we have a chance to really understand how we can streamline our processes. When documents are on everyone's individual desktops, you can never be sure that the process is followed consistently. Now, the global template supports everyone involved in the process to follow the desired specific procedure. As the number of studies increase we can start to look for ways to reduce complexity; we can adjust and improve our safety processes. Ultimately improve the business. We have this chance now."

1 www.BASF.com



## S-Chem

### S-Chem Realizes 25% Savings on Costs and 75% on Time Through Improved Management Of Change Process

A pioneer in the production of petrochemical products, Saudi Arabia-based S-Chem comprises three companies: Saudi Chevron Phillips Company (SCP), Jubail Chevron Phillips Company (JCP) and Saudi Polymers Company (SPCo). Together, these entities operate with the mission of safely producing reliable, optimal cost and high quality products while exceeding customer, community and partner expectations.<sup>1</sup>

With an enterprise focus on operational excellence, S-Chem maintains its high standards and complies with regulatory requirements. Therefore, the company continually looks for ways to innovate and improve its processes to mitigate the safety and environmental risks inherent in the petrochemical industry. One key area is managing the multi-step workflows involved with expanding existing operations or building new facilities.

“Partnering with Sphera has enabled us to better manage change, leading to heightened operational excellence and efficiency,” said Udayakumar Selvam, Senior Process Safety Management (PSM) Engineer, S-Chem.

#### Streamlining the MOC Process to Better Manage Complex Workflows

In the petrochemicals industry, operational changes to a new or existing facility need to be managed carefully to reduce process safety, personnel safety and security concerns. Therefore, it is a business imperative to have a solid process for risk mitigation through effective Management of Change (MOC). In the past, S-Chem relied on a cumbersome paper-based MOC system to manage the complex workflows and multiple action items necessary to add new equipment or make other operational changes.

S-Chem turned to the Sphera Operational Risk Solution as a means to automate, standardize and improve the MOC process. Initially, S-Chem used the solution only within the Process Safety department. Based on proven efficiency and accuracy gains, the company greatly expanded its use of Sphera’s Stature® software for managing MOC and related risk management processes. Today, hundreds of employees throughout the enterprise rely on the web-based solution as a centralized method of identifying and monitoring all of the steps, approvals and tasks involved with an operational change.

#### CHALLENGE

- Automate the process to manage operational changes and assess risks
- Reduce time and costs involved with manual processes
- Ensure compliance with regulatory and corporate standards

#### SOLUTION

##### Operational Risk

- Management of Change (MOC)
- Action Item Management
- Process Hazard Analysis (PHA)

#### RESULTS

- Processed approximately 1,500 MOCs between 2010 and 2015, with periods of increased activity tied to company growth
- Reduced time spent on manual MOC data compilation processes by 75% – from one day to 1-2 hours per MOC
- Experienced 25% monetary savings through automated MOC process
- Received commendation from affiliate company president for use of sustainable system to support operational excellence

# S-Chem Realizes Cost/Time Savings with Improved MOC

## Saving Time and Reducing Business Costs

“The manual process was complex and time-consuming,” said Selvam. “Each MOC is made up of six to nine steps, so it took us almost a whole day just to compile all the necessary data. With the web-based solution, we’ve been able to significantly reduce the time we spend on each MOC to one or two hours.”

S-Chem sees the benefits of having a centralized, web-based system that clearly identifies required steps and approvals and prompts appropriate team members to take action. “When the raw information is retrieved instantly, team members no longer have to “go from department to department looking for hard copies. They can just access everything on the Stature platform. That saves time and makes everyone more efficient.”

Due to streamlined workflows, Selvam estimates that S-Chem has experienced a 75 percent time savings across the Management of Change process. In addition, he said, “As a result of the time savings, we’ve experienced a 25 percent reduction in expenses related to the MOC process.”

## Supporting Corporate Expansion

According to Selvam, S-Chem processed approximately 1,500 MOCs between 2010 and 2015, with periods of increased activity tied to company growth. One of the S-Chem companies, SPCo, is currently expanding to increase future production capacity. As it and other S-Chem companies add boilers, furnaces, combustors and other new equipment, they process more MOCs, emphasizing the need for an accurate, automated MOC process.

## Empowering Employees with Automated MOC

Inputting all MOC-related data into a centralized system improves accuracy and reduces errors. “Today, the MOC owner still needs to be a subject matter expert, but the system makes his job a lot easier. In fact, I’d say that our people are able to work a lot more independently, rather than needing the support of a PSM representative at every step of the MOC process. This is a really positive improvement.”

The system also simplifies the process of tracking metrics related to MOCs, such as the percentage of MOCs that are fully compliant with procedures and the percentage of safe start-ups following changes.

## Ensuring Compliance with Centralized Tracking

For S-Chem, Process Hazard Analysis (PHA) and management of change are closely related, and the company benefits from having an integrated solution that combines the two. Accurate action tracking is critical for minimizing safety risks, and for incident investigations and audits.

S-Chem relies heavily on the centralized action tracking process when it conducts emergency drills, which are critical for minimizing safety risks, as well as for incident investigations and audits. “For example, when an auditor comes in, he’d easily find every action item and incident related to a specific piece of equipment,” said Selvam.

As a regulated enterprise, S-Chem must adhere to radiation safety, environmental and securities-related standards, as well as to safety standards set by affiliate organization of CPChem (Chevron Phillips Chemical Company, USA). Using a centralized system to track risk analyses and mitigation actions is essential to ensuring compliance with multiple standards.

*“As a result of the time savings, we’ve experienced a 25 percent reduction in expenses related to the MOC process.”*

Udayakumar Selvam,  
PSM Engineer,  
S-Chem

## Improving Transparency at All Levels

For team members directly involved in the MOC process, the automated system emails the task owners to make people more committed to taking appropriate actions in a timely manner. “We now have a far more transparent process, which makes everyone involved more accountable and responsible as a team,” says Selvam.

S-Chem’s senior management is also strongly committed to the improved MOC process. Every month, the Incident Investigation action items and Process Hazard Analysis action items are compiled for review by corporate management. A president at an S-Chem affiliate company commended the company for its commitment to closing all action items by their due date and for using a sustainable, automated process to improve operational excellence.

“Sphera has truly been a trusted partner in helping S-Chem to better manage change, reduce risk and improve operational excellence. In fact, I’ve recommended Stature to other companies while participating in information-sharing forums,” said Selvam.

1 <http://www.schem.com/uniqueidg46f124970bbd8faba6d6dfcf423f3ab/uniqueidg0/English/ourvision.html>



# Sipchem

## Sipchem Heightens Accountability by Implementing Process Safety Improvements for Operational Excellence

Sipchem is a globally recognized chemical manufacturer in Saudi Arabia that sells more than 2.4 million tons of petrochemicals with revenues surpassing SR 4 Billion in 2014<sup>1</sup>. Since its founding in 1999, Sipchem has been on the cutting edge of advances among chemical companies in Saudi Arabia, differentiating itself through its use of advanced technology and its concern for safety and environmental responsibility.

Sipchem continually works to follow international standards and improve processes surrounding safety, health, the environment and security. In 2011, it became the first chemical manufacturing company in the Kingdom of Saudi Arabia to achieve the prestigious Responsible Care® certification. Responsible Care is the chemical industry's global initiative to drive continuous improvement and achieve excellence in environmental, health, safety, and security performance of products and processes.

As part of its commitment to safe, clean, energy-efficient operations, Sipchem has long looked to Sphera for help in developing process safety methodologies and getting their staff up to speed on them. Since 2005, Sipchem has been using Sphera's Stature for Risk Assessment to assess operational risk around its process safety procedures, pinpointing problems, diagnosing their cause, and evaluating solutions. Using Stature, Sipchem has been able to document necessary modifications to its safety procedures much more quickly and thoroughly.

By 2011, the company was looking to take the next step. It wanted to adhere to industry best practices by implementing a new Management of Change (MOC) solution to improve its ability to ensure that the recommended changes were completed and implemented properly. "We wanted to meet the requirements for Responsible Care while achieving a higher level of efficiency," said Nedhal Al Keoshi, Senior Corporate Quality Coordinator for Sipchem.

The company addressed this issue with the help of the Sphera Management of Change (MOC) solution.

### Improving Safety Process Workflows

Previously, Sipchem had used several simple workflow systems to manage change. While these solutions could manage basic workflows, they were not designed by plant safety experts and lacked the sophistication to handle the change management processes and sub-processes necessary for chemical plants. The systems, moreover, lacked the configurability that would have enabled Sipchem to modify workflows themselves to better suit their needs. Nor did the vendors have the process safety expertise to properly implement changes for them.

### CHALLENGE

- Comply with safety, health, environment and safety standards to achieve certifications
- Improve efficiency and effectiveness of processes regarding safety, health, environment and safety
- Adhere to best practices by implementing a change management solution

### SOLUTION

#### Operational Risk

- Management of Change
- Risk Assessment

### RESULTS

- Ensured accountability – safety team follows discrete, auditable processes to guarantee that safety process changes are made properly
- Automated adherence to best practices that come out of safety studies
- Improved safety process efficiency and consistency
- Helped safeguard against safety disasters

# Sipchem Heightens Accountability for Process Safety

With Stature for MOC, Sipchem now has a solution developed with a deep understanding of its business pains. If modifications are necessary, the system's configurability makes it easy for Sipchem to accommodate them without significant customization. As it grows and changes, Sipchem can easily add new users simply by entering their name and security role.

The system's ease of use makes it easier for Sipchem to ensure that users take advantage of the solution. Said Al Keoshi, "The system is very elegant and easy to use while still covering our safety needs. It has been very easy to introduce the tool to people even if they haven't used anything like it before. We simply conduct awareness and training sessions. Although there's a lot of material, it's all very clear. Included flow charts help explain the new procedures. Sphera continues to help us with optimization, technical support and training."

## Ensuring Complete Accountability

For Sipchem, the biggest benefit of using Stature to manage MOCs has been accountability. Stature allows Sipchem to identify and track all of the risks associated with their MOCs and ensure that the safety team follows discreet, auditable processes to make the necessary changes.

In particular, the risk assessment process typically generates a large number of actions that must be taken to remediate issues. Each of these actions may include complex sub workflows and sub-actions. If the company were to complete these processes using email or other manual processes, they'd have to go through considerable back and forth activity to track where each step was in the process and ensure it was completed. Now, automated workflows control critical MOC or facility change request processes. If someone fails to take an action at the required time, it's easy to determine where it is in the process and escalate that action to guarantee completion.

Sipchem's earlier MOC systems were unable to provide the requisite level of control. As Al Keoshi noted, "When the MOC system was managing facility change requests and MOCs, there were gaps in closing out issues. That made it easy for users to misuse the tool and say that steps were completed when in fact they were not. It wasn't obvious to the system administrator whether an action had been completed or closed out effectively. And there was no way to follow up."

Sipchem can now also take advantage of auditing capabilities to prove both to itself and to auditors that it has done everything necessary to keep its plants safe. With this information, all levels of management have a much better picture of how well the company is managing change throughout the organization.

Ensuring that changes are completed properly can literally be a matter of life and death. "We're able to make sure our safety team completes all of the necessary steps to implement a change using Stature for MOC. Without a system like this, tasks might not be completed and the result could be a safety disaster," said Al Keoshi.

## Strengthening Adherence to Best Practices

Sipchem has been able to bake best practices into workflows using Stature for Risk Assessment and MOC. As safety staff perform risk assessment studies or MOCs, Stature incorporates lessons learned. Whenever the safety team subsequently performs the process, previous experience informs the workflow. The solution automatically guides users in their decision making to consider various possible causes, consequences or potential safeguards based on these best practices.

## Driving Efficiency and Consistency

Using Stature MOC, Sipchem not only ensures and expedites completion of change management, they also improve consistency in the way people perform change processes across the company's nine plants. "We can now document our studies faster, more thoroughly and with greater consistency throughout our operations," said Al Keoshi.

## Building on a Trusted Partnership

In the future, Sipchem plans to continue to improve its safety operations. Said Al Keoshi, "Our goal is to achieve excellence throughout our operations so we can produce high quality and safe products that don't harm the environment. Sphera has been — and will continue to be — a trusted partner in helping us achieve our objectives."

"We're able to make sure our safety team completes all of the necessary steps to implement a change using Stature for MOC. Without a system like this, tasks might not be completed and the result could be a safety disaster."



Nedhal Al Keoshi,  
Senior Corporate Quality Coordinator  
Sipchem

1 <http://www.sipchem.com/en/about-sipchem/our-journey>



# Total Petrochemicals & Refining

## Total Petrochemicals & Refining USA Enhances Management System Audits and Risk Assessments for Integration with Incident Reporting

A decade ago, Total Petrochemicals & Refining USA (TPRI) established itself as a global leader in risk management. The Houston-based company deployed market-leading environmental, health and safety (EHS) incident management and reporting software – Sphera Impact – at all 17 Total Petrochemicals facilities worldwide to drive operational excellence and ensure compliance with industry regulations and standards. Nearly 5,000 licensed users work in the system to generate state-of-the-art reporting that helps EHS managers track incidents and response actions while proactively reducing hazards and improving work processes. The company’s injury rates and costs have declined over the years and yet its leadership was not satisfied.

“We are committed to a management system approach that promotes continuous improvement,” said Karen Jones, CIH, Manager of Occupational Health, Crisis Management, and HSSE IS Applications for TPRI. “We are always looking at our operations to see how we can make our business work better. That’s why we also made a commitment to consolidating information systems across the company, picking the best ones and phasing out the rest. In this case, it became apparent that one small, outdated application that was supposed to facilitate the auditing protocol for our management system was actually holding us back.”

The legacy software’s auditing protocol included more than 1,500 questions but, because it was a proprietary product from a third-party vendor, the TPRI team could only add, edit or delete questions by submitting the change to their vendor so the vendor could make the changes (for an hourly fee) and return the database afterwards.

“It was such an ordeal that we almost never made changes over the years, despite the fact that our management system continued to evolve,” explained Jones. “Even when we did not want to make changes and everything was ‘working,’ the whole process was inefficient. We had to cut and paste audit findings from the legacy system into Impact, and then do extra quality control on that manual data entry, before we could assign and track our corrective actions or proactive risk reduction measures to completion.”

In 2010, the problems increased when the entire company upgraded its IT infrastructure, by switching to a different operating system. The legacy auditing tool developed a series of functionality problems and the team decided it was time for a new strategy.

### CHALLENGE

- Simplify compliance to environmental, health and safety regulations and ISO protocols
- Overcome limitations to management system auditing and risk assessments
- Monitor the level of risk in relationships with value chain partners

### SOLUTION

#### Operational Risk

- Risk Assessment
- Incident
- Audits

### RESULTS

- Established fully enabled management system audits and assessments, from questionnaires to complex scoring algorithms for risk scoring
- Replaced outdated legacy application and initiated integration of multiple systems
- Gained ability to update management system auditing protocol questions without waiting for – or paying – a third-party vendor
- Reduced time required each month to manually transfer findings from 1,500 audit questions – from 3-5 days to a few hours
- Positioned new system as framework for future risk-ranking of value-chain partners as required for ACC Responsible Care compliance

## TPRI: Audits, Risk Assessments and Incident Reporting

“We wanted to be in control of our destiny,” said Jones. “We wanted to be able to make changes to our audit protocol questions ourselves and get the audit results into Impact automatically. We talked about doing serious customization inside of Impact but it looked like that was going to be difficult. Then we got a call from the Sphera team. They had checked to see if we could get the capabilities we needed in another product called Stature. When they showed it to us, it was beautiful – I got goose bumps! The only question was how we could get the results into Impact.”

Jones and the Sphera experts came up with a plan. First they would use Stature to support her company’s management system auditing needs as well as improving their risk assessment capabilities by providing a central knowledge base where lessons learned and best practices are stored and shared. Later, when the next version of Impact was released, they would streamline the process of making the information actionable by integrating *Stature* and *Impact*.

The TPRI team’s interest in integrating Impact with Stature fit well with new guidance from the newly formed Total Refining & Chemicals Branch. The leadership in Paris/Brussels had recently launched a major initiative called MAESTRO that is intended to converge multiple HSE business processes, procedures and programs into one management system. When Jones proposed integrating the Sphera systems, they approved the project and watched as it moved forward.

“We have configured Stature for our management system audits, and validated that the configuration will work for the new MAESTRO management system. We are also moving our process safety studies – which we previously did with another Sphera tool [*PHA-Pro*®] into *Stature* because that’s what it’s made for,” Jones said. “Additionally, our goal is to be able to track anomalies – for example, near-miss incidents such as a hose hanging over a curb that we discover during a housekeeping audit or perhaps a finding in a process hazard analysis, or even just a document that is out of date – we want to track anything that, without controls in place, could become an incident. I need to get all of those into one system, Impact, so we can develop action plans and generate the reports that are required for compliance and corporate sustainability.”

By working together closely on this project, Jones believes that the Sphera and TPRI team is making good progress on the system integration.

“Later this year we expect to be importing everything into Impact automatically. It will be so much faster, easier, more efficient and more accurate when we can get everything all in one place without this extra burden of transferring information,” Jones said.

The TPRI team expects to achieve major efficiency gains as the integration proceeds. They have already eliminated the

need to wait for the vendor to update questions in the legacy system’s auditing protocol. And Jones believes that the team will no longer be required to spend an estimated 4 hours to 2 days depending on the quantity and complexity of audit findings manually cutting and pasting answers from one system to another in order to compile data needed for weekly and monthly reports, since that entire process will now be automated and should only take a few hours. Equally important, because it is only entered once, data integrity will increase while time previously required for additional quality control steps will decrease.

In the next phase of their enterprise risk management system integration project, the TPRI team plans to support auditing of the company’s “value chain” partners, as required by the American Chemistry Council’s Responsible Care program. With Sphera audit capabilities, TPRI team will be able to monitor their partner relationships and risk-rank each partner based on audit findings. They also plan to look at the possibility of addressing another category of risks by enabling Stature to support Security Vulnerability Analyses (SVAs).

The TPRI vision for its risk management systems and continuous improvement of its business operations has also been informed by the role that Jones and others have played in the ground-breaking Operational Excellence Forum. By participating in its pilot study, which collected and analyzed data from 14 companies – including millions of records managed in the Sphera Operational Risk Solution – the team has been able to start benchmarking TPRI risk management performance in relation to industry peers.

“This project will help us simplify our risk management processes so we can be more efficient about ensuring compliance and continuously improve our operations.... We wanted to be in control of our destiny and now we’re on our way.”

Karen Jones, CIH  
Manager of Occupational Health & Crisis Mgm’t,  
Total Petrochemicals & Refining USA, Inc.

“This project will help us simplify our risk management processes so we can be more efficient about ensuring compliance and continuously improve our operations. We knew that using an integrated Sphera risk management information system was a step in the right direction and that it is right in line with the Refining & Chemicals Branch’s strategy for convergence,” Jones concluded. “We wanted to be in control of our destiny and now we’re on our way.”



## Vale

### Vale Gets Solid Grip on Global Performance and Priorities in Pursuit of Enterprise Risk Management Goals

One of the world's largest mining companies, Vale, is striving to achieve best practices in risk management. Headquartered in Brazil, Vale is the market leader in production of iron ore and ranks second in production of nickel, as well as producing pellets, coal, copper, fertilizers, manganese and ferroalloys - with around 195,000 employees working in 30 countries on five continents. As a member of the International Council on Mining and Metals (ICMM), Vale is publicly committed to "implement[ing] risk management strategies based on valid data and sound science."<sup>1</sup>

Today, Vale is developing a comprehensive new strategy for Enterprise Risk Management. The company's operational risk management team had historically focused primarily on loss recovery, looking at how the cost of assets could be protected through insurance. In 2006, however, Vale's risk managers saw that they needed to take a broader view by identifying potential events or circumstances that might impede their company from achieving its business objectives, assessing those issues in terms of their likelihood and magnitude, determining preventive or remedial actions, and then monitoring the progress of those actions to completion.

The Operational Risk team at Vale recognized that the success of their evolving strategy would depend upon their ability to collect, aggregate and analyze vast quantities of information from across the company so they established a framework for integrated risk management. This framework was designed to provide standardized policies, procedures and guidelines for risk governance as well as the tools and techniques required to translate rules into action by measuring risks, making decisions and assigning/tracking tasks.

For the first few years, Vale's risk managers tried to support the risk framework with hundreds of spreadsheets and databases. "We probably performed a dozen risk assessments within each business unit and we have 30 plus business units. Managing all of that data in spreadsheets was too big a job and ineffective," says Alain Valiquette, Operational Risk Manager for Base Metals at Vale. "So we went on the hunt for a global software solution. We looked at a short list of vendors and it quickly became apparent that Sphera is the leader. Since we'd already used other Sphera risk software successfully for several years, it was a natural next step for us.

#### CHALLENGE

- Develop a comprehensive strategy for Enterprise Risk Management
- Provide information foundation to support the framework for integrated risk management
- Embed risk management in the daily corporate culture by sharing information
- Drive operational excellence by streamlining workflows and uncovering efficiencies

#### SOLUTION

Operational Risk

- Risk Assessment

#### RESULTS

- Enables ERM strategy by replacing 100's of spreadsheets with one global risk management information system
- Empowers operations team by providing standardized risk data tool and workflows
- Reduces time to roll up enterprise risk data into a report by up to 99% - e.g. from an estimated two hours to two minutes
- Generates risk assessments that ensure future funding for risk control actions
- Developing innovative "heat-map" reports that offer various decision-makers tailored views of their risks and responsibilities

## Vale Gets Solid Grip on Global Performance and Priorities

"In 2010, Vale selected *Sphera's Stature*<sup>®</sup> software - part of their Operational Risk Solution - as the enterprise wide foundation for the risk framework. With this new centralized information system, Vale's Operational Risk team can now identify, analyze, mitigate and monitor enterprise-level risks on a collaborative web-based platform, where lessons learned and best practices can be shared across the business.

"Implementing a global risk management model in a company the size of Vale is a truly huge challenge," said Jose Lyra, General Manager of Operational Risk, at Vale. "We have a clear vision and strong commitment from our leadership but we needed a flexible system that would evolve with us as our program matures - and not require too many manual interventions. Sphera has shown itself to be a good partner on our journey to risk management excellence."

"Our ultimate goal is to empower the operations team by offering them a tool that is simple, easy to access, and able to provide the information they need to make better decisions," Valiquette said. "With the global Sphera system, we have data standardization, sharing, version control, security, and the ability to consolidate information into a risk register. As a result, we've also uncovered new operational efficiencies. We used to need a couple of hours to roll up data from across the company and now we can do it in a couple of minutes - just the time it takes to print a report."

Vale's Operational Risk team continually works to embed risk management within the corporate culture, as part of the daily life of every employee in order to prevent or mitigate all kinds of disruptive incidents that may cause worker injuries, environmental destruction, asset damage and other impacts. The risk framework and *Stature* play an essential role by consolidating the company's risk information in one system and actively engaging stakeholders throughout the organization.

"When we go out into the plants, operations and mines - and the staff asks what risk tools we are using - the answer is simple," said Valiquette. "We say 'we have *Stature*. It's enterprise risk software. Here's your login. Use a template.' It's an easy sell, which is a big benefit for us as we continue standardizing best practices in risk management companywide."

"A significant amount of work goes into identifying enterprise risk events, conducting risk assessments, prioritizing risks and implementing controls to prevent and mitigate risks, including ensuring budget availability," said Kenneth Tan, General Manager of Business Planning and Integration for PT Vale Indonesia. "*Stature* provides us with an easy-to-use platform to register this work, update it, manage it and report it in an effortless, integrated manner that is consistent across the company."

Now that it is implemented at many of Vale's facilities worldwide, the Operational Risk team uses *Stature* to enable transparency and accountability throughout its risk management processes. They show each manager at Vale the risks that they are responsible for handling, what specific actions are planned to control those risks, which actions are on track and which aren't, and what additional resources may be needed.

When providing information to the company's senior executives, Valiquette said, "We use the risk framework to integrate and prioritize risks from across Vale's global operations. EHS, regulatory, social, legal and financial risk information all comes together so our decision makers can focus on what's most important and what needs to be done."

The Operational Risk team reports those risks that could have the largest potential impact on Vale's global operations. Risk assessments from *Stature* feed into Vale's strategic planning cycles to:

- Drive operational excellence by continuing to streamline workflows and provide additional control actions as needed to mitigate future risks
- Ensure that money is included in the budgets for future years to fund ongoing risk control actions

Looking ahead, the Operational Risk team continues to build leading-edge information management capabilities to support its overall risk management strategy. Among the innovations now in development are Risk Reporting Key Maps that offer Vale executives a 'heat map' of risks plotted across their global organization. These new risk reports allow key decision-makers at different levels of the organization - from corporate vice presidents to business unit directors to front-line facility managers - to drill down to see their particular risks and responsibilities.

As promised in its ICMM commitment, Vale is indeed implementing a risk strategy - an Enterprise Risk Management strategy that is solidly based on valid data and sound science.

"We use the risk framework to integrate and prioritize risks from across Vale's global operations. EHS, regulatory, social, legal and financial risk information all comes together so our decision makers can focus on what's most important and what needs to be done."

Alain Valiquette,  
Operational Risk Manager-Base Metals  
Vale



## Integrated Energy Firm

### Global Energy Firm Enhances Operational Excellence and Integrates Risk Assessment with Management of Change

As a leading integrated energy company, this global energy firm committed itself to maintaining the highest standards of worker safety and environmental performance throughout its operations, which span the exploration, production, generation and sale of energy to millions of households and businesses. In support of this objective, the company's Environment, Health and Safety Policy emphasizes the importance of recognizing and managing risks in order to protect both people and the environment.

In the oil and gas industry, every engineering and operational decision and action must take into account a multitude of factors in order to mitigate operational risks, many of which can have serious consequences if not managed effectively. Therefore, the firm's decision-makers require consistent and reliable processes and systems to identify, assess, mitigate and monitor the risks involved in projects. "The Sphera Operational Risk Solution helped us heighten operational excellence, mitigate potential business risks and ensure compliance with regulations and standards," said the critical systems lead at the firm.

#### Strengthening Operational Excellence with Centralization and Consistency

In the past, upgrading a piece of plant equipment or assessing the risk involved with building a new facility involved multiple processes, some paper-based and some using basic software or databases. To improve accuracy, the firm recognized the need for a consistent process for two interrelated activities: 1. identifying and mitigating operational risks; and 2. effectively managing and documenting the process of making operational or engineering changes.

Several years ago, the firm implemented an off-the-shelf version of Sphera's Stature® for both risk assessment and management of change (MOC).

The experience was mixed, however the firm saw benefits of the software and decided to significantly upgrade and tailor the workflows to its own processes. The firm has since mandated usage of the system for approximately 1,200 engineering and operational team members at all of its gas processing facilities, power stations and LPG distribution centers across two countries. "Today, Sphera software provides a centralized source of truth for our engineering change management and process hazard analysis during the design of an asset" said the process safety manager at the company. "We've been able to heighten operational excellence and efficiency by using the system enterprise-wide."

#### CHALLENGE

- Centralize the process to manage operational changes and assess risk
- Ensure that major projects can be commissioned on time
- Track risk mitigation actions to completion

#### SOLUTION

##### Operational Risk

- Risk Assessment
  - HAZOP, HAZID
  - LOPA
  - Design Review
- Management of Change (MOC)
- Action Item Management

#### RESULTS

- Provided 1,200 engineering/operational team members at 50 facilities with system access
- Formed part of the solution to achieve the best-ever safety score with 20% decrease in TRIFR, recordable injuries
- Supported a \$20 billion 500km LNG project to deliver on time and without catastrophic incident
- Reduced MOC audit actions from over 30 to zero in MOC audit
- Tracked actions between MOC and risk assessment to ensure risk mitigation

# Global Energy Firm Enhances Operational Excellence

## Achieving Stellar Safety Record with Better MOC

Prior to implementing a consistent MOC process for asset design, the firm experienced some inconsistencies with the way processes were implemented: changes were documented in an inconsistent manner; some people were missed in terms of notifications. “Now, we have assurance that we are managing engineering change correctly,” said the process safety manager. “When we modify something at a plant, we know that we’re assessing the risks, completing the engineering, getting the right internal approvals and following the change through to all the impacted systems and ensuring we’re meeting our compliance requirements.”

With more than 1,000 MOCs per year, the potential for an incident has been decreased by the use of Sphera software. A major incident could result in serious safety issues as well as have a substantial impact on the company’s profits and reputation. “For example, an explosion in a gas field can be serious if it’s not managed properly. That’s the kind of thing that a centralized MOC process supported by effective software solutions helps us avoid,” said the critical systems lead. “We have not had a major incident related to asset design.”

Migrating all of the data from various systems, the critical systems lead explained, “took months because people could not locate the paperwork and they weren’t closing out actions” to show that the risks identified in process hazard analyses (PHAs) had been mitigated. “Since then, the company has seen a significant culture shift because plant changes now always follow the engineering MOC process in Stature. We now have evidence of a high rate of PHA study close-outs, helping to demonstrate the reduction of risk as far as possible.” A recent audit of 60 MOCs showed that all contained the necessary information.

The firm recently scored its best-ever Total Recordable Injury Frequency Rate (TRIFR) safety score and the move to the centralized MOC process was part of what made this possible. “Across the board, we’ve had a 20 percent improvement in recordable injuries,” said the critical systems lead.

## Delivering on Time with Effective Risk Management

The use of Sphera software was especially beneficial when the firm implemented the upstream portion of the cross-country LNG Project to construct a 500 km transmission pipeline to an LNG processing facility. This project involved 20,000 Process Hazard Analysis actions. The team had been using an Access-based system with paper close-out sheets, which was manual and lacked the end-to-end flow through showing risk mitigation actions had been completed.

“If we were commissioning a particular gas processing plant, for example, we had no way to show all of the close-outs associated with that plant,” said the critical systems lead. “We can’t commission a plant without evidence all of these risk reduction actions have been taken care of.”

It took the team six months to clean and centralize all the data with the web-based system, which he says helped them “gain control over the MOC HSE risks associated with the project.

Overall, the project was delivered on time, which I believe would have been very difficult to achieve without the Sphera

software supporting our process,” said the process safety manager. “If we’d had to delay commissioning of a plant, it could have had substantial cost implications.”

## Linking Risk Assessment to MOC

The firm has benefitted from the integration between MOC and risk assessment work processes and software support. In the past, when the company had multiple instances of the same type of equipment running at different locations, it needed to run risk assessments on each one separately. Today, when the company has an issue at one plant, it can assess the risk there and then apply the change across all similar plants. “For example, we have over 1,000 wells currently producing gas,” said the critical systems lead. “They all use similar technologies. We can risk assess and correct the issue on a small group of pilot wells, then use the MOC process to transfer the solution to other wells. So, we know we’re implementing consistently across the board, which will later save us significant money.”

## Providing Key Stakeholder Reporting

Today, with better processes and software support to mitigate operational risk, the firm is able to meet the needs of its diverse stakeholders. “Our staff knows the company is looking out for them,” says the critical systems lead. “Leadership pays close attention to safety, and rewards team members based on the safety rate. A strong safety record also helps make the firm a more enticing business partner and a better corporate citizen.

“Audits show that our systems and procedures are fully compliant with local laws, our internal procedures and our business partners’ expectations,” said the critical systems lead. “Sphera software helps support us to deliver this compliance.”

“Today, Sphera software provides a centralized source of truth for the entire organization. We’ve been able to heighten operational excellence and efficiency through enterprise-wide use.”

Critical Systems Lead  
Global Energy Firm

## About the Sphera Risk Assessment Solution

The Sphera Risk Assessment Solution, with its proven enterprise software, content and domain expertise, strengthens and improves your risk assessment processes including:

- Process Hazard Analysis (PHA)
- Hazard and Operability Study (HAZOP)
- Management of Change (MOC)
- Layer of Protection Analysis (LOPA)
- Job Safety Analysis (JSA)
- Security & Vulnerability Analysis (SVA)
- Bow-tie Analysis
- What-if/Checklist Analysis

It helps you implement full traceability from assessments to mitigation strategies and monitoring of controls. Unifying essential risk lifecycle steps on a single, global platform with a closed-loop, continuous improvement process. It also helps to build a central risk knowledge base and gain better visibility across the organization to prioritize resources. Contact us for more information on how we can help you with your risk assessment processes.



### About Sphera

Sphera is the largest global provider of software and information services in the operational risk, environmental performance and product stewardship markets. For more than 30 years, we have helped over 2,500 customers, and hundreds of thousands of individual users, across more than 70 countries to optimize work-flows and navigate the complex and dynamic global regulatory structure.