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Enterprise Content Management in the Energy Industry: Increase Safety and Reliability, Reduce Costs and Damages

CONTENTS

Some of the most devastating commercial accidents—to human life, to the environment, and to the economy—have been in the realm of the oil and gas industry. The Gulf of Mexico oil spill in April 2010 is still being battled in the courts and on Wall Street. BP has set up a $20 billion trust for compensation to workers, area residents and businesses, and the government and has a $38 billion program set up to sell off assets to help with the compensation. In the two months after the incident, the company's market cap dropped more than $100 billion, according to the *Wall Street Journal*.

The cleanup efforts alone may be protracted and expensive. According to the National Wildlife Federation,[1] the Exxon Valdez spill in 1989 still affects area commerce and numerous wildlife species—for a spill that was less than 11 million gallons, compared to the Gulf spill's estimated 170+ million gallons. The oil industry has learned quite a bit in the 23 years since the Exxon incident. BP's efforts have arguably been more swift and comprehensive than Exxon's, both in terms of environmental recovery and compensation to affected parties. However, it will likely be many years until we can understand the impact on the environment and the economy from the incident.

Pundits and journalists have also looked to blame the industry culture for exacerbating a harmful situation, if not causing it. Concern has ranged from rig workers incentivized to downplay hazards to management, to corporate heads that continue to invest in dangerous environments without the satisfactory safety measures in place, to a political system that favors company profits over worker and environmental safety. But regardless of what, if any, aspects of industry culture escalated the risk of a disaster, more detailed and better managed information has an important role in accident mitigation, if not prevention.

OPTIMIZE CRITICAL BUSINESS INTELLIGENCE WITH SINGLE-SOURCE DATA, PREVENT CATASTROPHE

Appropriate documentation and communication across different roles and entities on a project is critical to smooth and safe operations at an oil rig. Challenges that arise from varying areas of focus and company cultures are less problematic if all parties are on the same page. Shouldn't the E&P company, rig owner and operator all be working on the latest approved information and the same maintenance data?

The devastating amount of oil that spilled from the Macondo event was a result of the time it took for the well to be capped. Technical challenges such as the depth of the well and volume of flow caused several capping tactics to only work partially or fail completely. It was months before the well was deemed to be fully shut down. The amount of oil spilled was also in great debate immediately after the event and in the months that followed. While the parties involved were accused of not being forthright with enough data about the spill, it was also a time of great confusion and crisis. What if all parties had the same SOP system and data set to accurately and quickly ascertain the status of critical information to determine if there had been variation in how closely different safety and environmental regulations were being followed before the incident? Would single-source data have more clearly shown the challenges and solutions—as well as the chain of responsibility—of what was done, why

• The Oil and Gas and Utilities industries have seen spectacular failures in recent years, in terms of human life, the environment, and costs to the companies and communities.

• The Oil and Gas and Utilities industries still rely on antiquated e-mail and paper-based information and asset management processes.

• Considering the complexity of the Oil and Gas and Utilities industries, an Enterprise Content Management (ECM) solution needs to be secure, comprehensive, flexible, and responsive.

• Issues can be mitigated when all parties are on the same page with single-source data, including an enterprise-level SOP management system.

• The EMC Engineering, Plant and Facilities Management (EPFM) solution has the capabilities to document, search, manage, transmit, report and archive the large volumes of information, critical to safe, effective and efficient plants from engineering-construction to decommissioning.

it was done, when, and by whom? Would this have made recording and reporting of the damage of the well, the oil flow, the repair attempts and its eventual success clearer, more accurate, and possibly quicker? What if the company had an enterprise-level records and case management strategy that could demonstrate when and by whom the decisions were made leading to the well shutdown? What if the company had a transmittal function that could trace when well documentation, including engineering files, were sent and to whom, including review and approvals?

Going forward, this level of information would be invaluable. Identifying and clearly reporting appropriate safety and environmental compliance across all parties associated with a rig would reassure those parties and their insurers that appropriate measures to prevent crisis and ensure efficient operations would be in place and adhered to. This would be backed-up through the course of the project with clear and consistent reporting from the same system and with the same data, thereby surmounting any issues associated with varying company cultures and agendas.

GOING BEYOND MITIGATION TO PROJECT LIFECYCLE BENEFITS

Beyond the obvious benefits in preventing or dealing with incidents, the overall cost and efficiency benefits of such systems are also vital to everyday operations. What if these systems could not only avoid document errors, but also predict project status and cost? Having all parties connected on the same system with the same data eliminates estimates that may otherwise be influenced by operators that want to downplay challenges, owners that want to stretch aging asset lifespan and contractors incentivized to show a project is farther along than it is. These unintentionally biased interactions would be diminished greatly by a system that pulls, analyzes and reports the same accurate information across all parties. It also frees up resources and revenues otherwise spent on trying to do everything from interpret increasing industry regulations to finding the middle ground across disparate reporting parties.

Along with the oil and gas industry, gas and electric utilities have also experienced critical mishaps, causing severe outages, economic repercussions and even significant safety hazards. On the electric power front, the outage in India at the end of July 2012 left more than 620 million people without power— more than eight percent of the world's population. Outages across the U.S. and Europe have left tens to hundreds of millions of people without power as well.

UTILITIES' PAPER RECORD-KEEPING ANTIQUATED AND DANGEROUS: THE SOLUTION SAVES DOLLARS AND LIVES

Gas utilities, as well, have had their share of outages and incidents, some of them catastrophic. The San Bruno, California, gas pipeline explosion in September 2010 is an example. Eight people lost their lives and dozens of homes were damaged or destroyed. The incident cost more than $250 million in 2010 alone and costs continued mounting in subsequent years, up to triple the amount when considering the increased need for monitoring and upgrading that

the system will need. Lack of thorough knowledge of the system and its condition has been blamed for making the system vulnerable.

The startling reality about gas and electric utilities is the level of manual paperwork and lack of automation rampant in the industry. The San Bruno incident highlighted the difficulty many utilities face in knowing exact pipeline locations, specifications and conditions. PG&E, the utility that owns the San Bruno pipeline, is in an extended project trying to map and assess the health of its pipeline system. It is typical and not the industry exception in antiquated, paper-based record-keeping of these essential infrastructure systems.

What if utilities had ready access to complete and accurate pipeline information instead of outdated paper file systems? At the first sign of risk, what if the utility had immediate and secure access to all pipeline maintenance and inspection records from a single secure repository? This would provide an accurate, single-source data point that could be remotely accessed at any time and from anywhere, and allow the appropriate response to be immediately dispatched to the location.

Post-incident, reports to regulators and the government, as well as the message to the media and local communities, need to be assembled and dispersed. What if the utility had a records management policy that could provide regulators with relevant records for an incident, including documentation and related processes?

These independent events will continue to happen as populations grow and strain resources, while economies struggle to rebound and pay for the infrastructure improvements that could avert these situations. But in a climate of financial uncertainty, governments and corporations need to ensure that their investments show early returns and demonstrate immediate benefits. Being able to monitor and control workflows and data is one such implementation that carries the dual appeal of lowering cost in the long term and streamlining processes upon implementation.

Between increasing environmental regulations and ongoing "NIMBY"ism (Not In My Back Yard), companies building and commissioning new plants need to be keenly accurate in the management of data of their operations. According to a paper published for the *2010 International Conference on E-business, Management and Economics*,[2] poor management of project changes was the second biggest non-excusable cause for construction delay of a power plant (an "excusable delay" would be something beyond the contractor's control and without fault or negligence on the part of the contractor, such as an unforeseen weather event). Rounding out many of the remaining top 10 reasons were:

- Lack of mechanism for recording, analyzing and transferring project lessons learned (#3)
- Delay in forwarding material and equipment to the site (#4)
- Lack of effective managing and controlling subcontractors (#6)
- Delay in detail design by project engineer subcontractor (#7)
- Poor management of project site (#9)
- Poor management of project contract (#10)

Disasters and unforeseen events are always a risk that no information management solution can fully guard against. However, more detailed and better-managed information has a critical role to play in accident mitigation, if not prevention.

Disasters and unforeseen events are always a risk that no solution can fully guard against. However, reducing the variables that can lead to catastrophe and improving response effectiveness against incidents that still occur should always be the key goal of operations management and personnel. Challenges faced by the industry include:

Pre-construction:

- Environmental and regulatory compliance in construction. One of the major reasons for delays in power plant construction is environmental impact. While all projects conduct some level of environmental assessments before construction, the amount of documentation and legislation complicates the process. According to an interview with Frost & Sullivan, an individual at a state energy commission that reviews power plant construction for approval stated he often saw companies "bring projects with glaring deficiencies or fatal flaws" to the commission for review. These are major construction projects that are quickly tabled—and delayed if not canceled—due to these issues.

- Similar to the legislative concerns are concerns from neighboring residents and businesses that may oppose the plans. Carefully controlled documentation can help a company create a ready response to such concerns, both with releasing the right statements to the public and preparing for any legal challenges.

During construction, operation, and decommissioning:

- Regulatory, environmental, and health and safety violations. The best way to avert the dangers and costs of a catastrophe is to avert the incident in the first place. While proper documentation and organization is not a guarantee, the lack of such can put a company at great risk. Sub-par or lacking inspections and reporting have been at least in part at fault for most of the incidents noted above. If an incident does occur, proper protocol in documentation can help shorten the investigation time and protect against liability.

- Unplanned/unexpected downtime; cost overruns; extended hand-over process. An issue that presents itself and leads to delays in construction or operation can cost a project in lost revenue, regulatory fines, potential risk in higher fees from insurance and financing, as well as risk in clients' confidence levels.

- During Decommissioning: Environmental concerns from regulators, residents. Both regulators and the local population will have concerns about the environmental impact of a decommissioning power plant, refinery, oil field or other industrial site. Concerns may center on the plant's dismantling as well as any industrial pollutants that may have been monitored during the operation of the site, but would now need to be properly mitigated.

CHALLENGES TO MAINTAINING AND MANAGING INFORMATION FLOW

One of the key challenges in managing information in both energy and heavy industry is simply the sheer amount of information generated before and during construction, operation and through to decommissioning. A construction project with multiple contractors, sub-contractors, equipment, ambient conditions and agendas can quickly degrade into a vast

array of systems that only address direct resources but do not communicate with each other or the project as a whole. It is human nature for project management to focus on the issues at hand and short-term milestones, and difficult for a site owner to mandate all these moving parts pay as much time and attention to the overall project as at their current issues at hand. Nor might a site owner want the team distracted from their core competencies more than necessary. A data solution needs to be in place that can capture and manage as much of the information as possible and leave the skilled labor to its skilled work.

HOW TO EFFECTIVELY REDUCE RISK AND MITIGATE COSTS

For an enterprise content management solution to be able to make a significant difference in the everyday operations and risk aversion of an energy plant or industrial facility, it needs to be comprehensive, flexible, and responsive. The EMC Engineering, Plant and Facilities Management (EPFM) solution has the capabilities to document, search, manage, transmit, report and archive the large volumes of information needed on a project. The solution has numerous capabilities, including:

- Configurable: EPFM already has features geared toward specific industries, thanks to close work with customers across the energy and industrial landscape. It also is further configurable for every site, the combination of which makes the start-up time for subsequent sites more streamlined.

- Flexible and adaptable: EPFM is flexible across many realms. It can be deployed in a hybrid cloud environment and is built on the EMC Documentum platform (already in use with more than half of the energy industry). It provides an open architecture for integration with other enterprise applications like maintenance and project management. The system is adaptable to every site and solution, but starts with a market-tested configuration that is applicable to 80 percent of the energy industry and 90 percent of industrial users.

- Support: EMC has a long-term commitment to support and enhance the EPFM solution, guided by the many successful deployments to continuously improve and expand the solution.

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