



Better Safety, Better Business

Maintain Compliance and Drive Revenue: Put All of Your Data to Work

Executive Summary

If you're like many oil and gas companies, you're already collecting massive amounts of health, safety, security, and environment (HSSE) data. But how long does it take to act on it? The answer, of course, is anywhere from months to years.

In today's regulatory climate, that's not fast enough. With many oil and gas companies pursuing unconventional projects, regulation becomes more of an issue. Meanwhile, new acquisitions often result in a messy patchwork of legacy systems, which restrict engineers' visibility into critical HSSE data from one refinery to the next. The outcome can be a compliance strategy that is more reactive than proactive, potentially costing millions of dollars in damages and even risking lives.

With the right analytics solution in place, all those silos of data can be integrated into a data hub for a single version of the truth, enabling you to take steps toward preventing incidents while improving efficiency across your organization. The result can be a complete transformation of your HSSE efforts from a regulatory chore to a revenue-generating competitive advantage.

Too Much Data, Not Enough Time: The Mayflower Oil Spill

On March 29, 2013, a 22-foot section of an ExxonMobil pipeline ruptured in Mayflower, Arkansas, releasing as much as 7,000 barrels of Canadian Wabasca heavy crude drawn from the Athabasca oil sands. The spill resulted in the evacuation of 22 homes. Just one month earlier, ExxonMobil had sent a small robotic device known as a smart pig through the pipeline to identify possible failures, but the device did not notice the tiny cracks along the pipe's lengthwise seam.

Even if the smart pig had noticed the cracks, the rupture was likely unavoidable. It can take several months to analyze the reams of data from a pipeline scan, according to Stefan Papenfuss, Vice President of Pipeline Resources at Quest Integrity Group. "You can have an inspection in January but not have a full understanding of the condition of your pipeline until the following January," he said in a recent Wall Street Journal article.¹ Acting on the information can take even longer.

¹ Oil-Pipeline Cracks Evading Robotic 'Smart Pigs', The Wall Street Journal, August 16, 2013.

Exxon didn't have months to spare, and that raises a critical question for oil and gas companies everywhere: When it takes months to collect and analyze critical HSSE data, the information becomes stale long before you can act on it. What can you do to change that? What steps can you take to reduce a one-year or six-month turnaround to just a few days?

Simply put, enabling faster analysis of HSSE data isn't just good corporate citizenship—it's good business. With the right data platform, you can collect and integrate more types of data into a single view. You can apply automated rules for proactive identification of potential problems. And by putting these capabilities to work on all of your data for fast, accurate analysis, you can see a considerable return on your investment in analytics technologies.

From Reactive to Proactive: Rethinking Compliance

Maintaining compliance is one of the oil and gas industry's biggest challenges. As the industry takes on new projects in unconventional reservoirs, regulation is steadily increasing at the federal, state, and local levels. Because every piece of equipment must have a permit, every refinery has a massive permit library. When regulators show up unannounced, engineers need to marshal a great deal of data to demonstrate compliance, all at a moment's notice.

Other factors make compliance an even greater challenge. When oil and gas companies acquire new refineries, they often find themselves with multiple legacy applications offering no single view into compliance-related data. Automation is the only viable option for performing complex analytics tasks on this growing mass of unassimilated information.

Unfortunately, single-purpose applications—for example, enterprise resource planning (ERP) modules—are often unable to support the level of automation necessary in today's data-intensive environments. Many companies, therefore, must rely on a patchwork of manual processes

that inevitably lead to human error and poor data quality. Engineers spend the bulk of their valuable time in data collection rather than data analysis. And if one person owns a manual process, that process may suddenly come to a halt if he or she leaves the company.

So what is the net result of all these challenges? Compliance becomes a reactive effort, not a proactive one. Problems flare up, regulators rush in, and companies scramble to discover what went wrong—all after the fact.

It doesn't have to be this way. With a broader range of data automatically collected for in-depth analysis, oil and gas companies can make fast decisions based on timely, detailed information to address potential problems in advance and help maintain compliance.

From Reporting to Analytics: The Power of Data Integration

Are you performing analytics, or are you just generating ad-hoc reports? That question isn't as unreasonable as it may sound. In many cases, oil and gas companies assume that they're already performing analytics, when, in fact, they're shuffling around a lot of stale data. By automating and integrating all of those ad-hoc reports, you can begin to transform your reams of information into relevant data that will enable truly proactive compliance.

For example, a company might run regular reports on temperatures and pressures within a particular piece of equipment. By integrating those reports with historical data—in other words, looking at past cases alongside present performance—you can gain greater insight into possible scenarios that may require intervention.

Data integration also gives you the power to reach beyond the walls of your organization. Drilling a well, for example, involves multiple companies, each contributing a vital engineering function while generating a great deal of data. All of that information can be collected in a central repository that provides every party with a 360-degree view.

Real value begins to emerge when you have more than one person—or even more than one organization—accessing the same business-critical data. After all, every observer has a different perspective to offer. By taking all those perspectives into account, you can begin to ask the

Case Study: A Single Architectural Change Leads to a Multitude of Opportunities

At one Texas refinery, the latest construction permit requires tracking per-minute data from approximately 1,500 environmental sensors across many locations. The facility attempted to meet those requirements by manually sourcing data into 65 unwieldy spreadsheets, requiring hours of unnecessary, error-prone labor every day.

By implementing a Teradata data hub, the refinery is able to bring several new sources online for in-depth reporting, performing real-time analysis on flare emissions, tank levels, firing rates, and more. Engineers now access critical information in hours instead of days, taking action as events are happening—not weeks after the fact.

challenging business questions that help you solve the most pressing (and potentially dangerous) business problems.

The Teradata Solution: When You Know More, You Can Do More

At many oil and gas companies, process-related information lives in one application. Asset-related information lives in another. Still more critical data resides in other databases scattered across the organization. Teradata solutions for the oil and gas industry can put all of that data to work for you.

With in-database analytics, companies can score reports and perform detailed analysis on data without removing any information from the data hub. Analytics is heuristic in nature, often requiring multiple iterations for maximum insight, and in-database capabilities can help reduce cycle time from hours to minutes. Teradata technology does the heavy lifting up-front so that engineers can sustain an ongoing conversation with their data.

Teradata solutions also offer a logical data model specifically designed for the oil and gas industry, with

a format that can easily analyze related assets across multiple locations or business units. That means you can consolidate all relevant information for better pattern identification, improving your ability to proactively make decisions and even search for new production sites.

In short, Teradata solutions offer a single version of the truth. That enables you to take action leading to greater compliance (and proof of compliance) with local, state, and federal agencies. You have the ability to communicate more effectively with outside influencers in the media and local communities. And perhaps best of all, you can directly impact the bottom line by improving operational efficiency and reducing time lost to incident resolution.

With oil and gas solutions from Teradata, industry engineers can perform the kind of real-time analytics that will transform HSSE compliance from a cost center to a distinct operational advantage that drives real revenue:

- Engineers in the refining line can more easily locate permits, create incident reports, and capture compliance information.
- Companies can more accurately pinpoint the correct times to clean or change out equipment with help from Teradata maintenance and reliability solutions.
- If a refinery is changing to a new product, Teradata solutions can offer linear programming capabilities to optimize the process.
- Teradata enables analytics that will help predict and prevent events, combining real-time and historical data to suggest specific actions for operational improvements.

Knowing more means doing more to move the business forward. With in-depth, up-to-the-minute information at your fingertips, you can produce outcomes that could save dollars, and possibly even save lives.

Leverage Data and Win

Some companies make the mistake of regarding HSSE compliance as a necessary evil. That doesn't need to be the case. HSSE efforts can drive you forward, helping you gain greater efficiency and additional revenue. HSSE compliance can be a framework for optimizing operations, not just another regulatory burden to endure. You can run your business on HSSE principles—and win.

Teradata can show you how. Our solutions help you make precise, informed decisions throughout the life cycle of your assets, exploiting the mountains of data already in your possession for maximum strategic advantage. For more information, see the resources for oil and gas professionals available at Teradata.com/oilandgas.

About the Author

Johnny Gipson is a Senior Industry Consultant for Teradata in the Oil and Gas segment. His experience stems from over 15 years in the oil and gas industry working downstream in refineries. Johnny's experience is in the areas of process design, operations, gasoline blending, scheduling, gasoline and crude market economics, investment planning, and performance and planning management. Prior to Teradata, he was the Business Performance Manager for BP Gulf Coast Refinery. Johnny holds an MBA and a Masters in Chemical Engineering from the University of Houston and received his B.S. in Chemical Engineering from Texas A&M University.

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