



WHITEPAPER

Buying an Oil & Gas Enterprise Asset Management Solution

A comprehensive guide for drilling and service companies

Choosing a maintenance management solution is no easy task. There are hundreds of Computerized Maintenance Management System (CMMS) / Enterprise Asset Management (EAM) providers available, and all can claim to have the solution you need. How do you know which is the right choice for your organization's unique needs?

It is imperative that upstream Oil and Gas companies minimize unplanned downtime and non-productive time (NPT) in order to combat constant industry challenges. Operational efficiency is crucial, and unlike manufacturing organizations, Oil and Gas operations are not typically housed in the same facility, same region or even the same country. Software technology is typically limited. Approaches to maintenance vary by individual, and paper is predominate. Implementing a common solution that follows the same structure regardless of location, will ensure each crew member knows what to do and how to do it. Electronic records ensure that audit trails are maintained, regardless of which manager is leading the shift or where the rig is located.

Having a well-organized approach to maintenance execution will help you avoid unplanned downtime. An effective maintenance strategy centers around two key components – people and processes. Arm your workforce with the proper tools, procedures, and instructions so they can perform work safely, effectively, and efficiently. By implementing a robust EAM or CMMS solution, designed for the Oil and Gas industry with maintenance best practices, you can standardize, enforce, and measure your process. With this two-pronged approach, your company can achieve increased equipment uptime, and your workforce can improve production.

This report will highlight key areas of consideration for selecting an EAM solution for companies in the Oil and Gas industry.

Ease of Use

On a rig with high production expectations, workers don't have time to waste navigating a system to find the information needed to perform their job or to enter data into a system to report on work completed. They must be able to access information quickly and easily. The solution must be able to meet the specific requirements of any given department or job function, with the least amount of key strokes or clicks. If the overall look and feel of the system is consistent and modeled after familiar applications, users will feel more comfortable maneuvering

through the screens and will be more likely to embrace the solution. The driver should be to “keep it simple” for the users. This is particularly important when considering the crew, as it is crucial that they complete the job safely and on time. Inserting an application into the process for them to use has the competing goals of minimally impacting their workflow while still serving its purpose of improving your operations.

For organizations with multiple sites, nationalities, and cultures among the crew, providing a solution with the local language and currencies is another requirement for ensuring user adoption. Engaging users in familiar terminology throughout the



application decreases the likelihood of misinterpretations of the data that is used or gathered. The ability to tailor the application to the regional or local dialects also reduces miscommunications among the crews. For example, a wheeled vehicle with a pronged device in front for lifting and carrying heavy loads is known as a “forklift” in the United States (U.S.) but as a “loader” in Canada. Familiar jargon ensures users are not struggling to understand the context of requests.

Reducing the amount of data the crew needs to concern themselves with is another feature which supports quick adoption. The option to segregate the data that users see, based on their areas (rigs and regions) of responsibility,

helps users focus only on information that is relevant to them and within their ability to affect. Additionally, rig managers who want full control over their data, so that other crews can't inadvertently update it, can use this data segregation feature in support of that need. And lastly, if you have a friendly culture of competition across your rigs or regions, this can limit visibility into the results of other rigs until the company is ready to publish them and rank the top performers.

Functionality that allows crews to easily report self-found work items directly into the system is a must-have in the solution you choose. Across shift changes – considering the dynamic and high pressure nature of the work load – you cannot let maintenance tasks remain undone, nor can you ignore known issues. Empowering the team to report unaddressed issues directly into the system will keep it visible across shifts and team members so that potential problems do not fall through the proverbial cracks. Work that was unable to be completed during a shift, safety issues identified by anyone on the site, and a visual indication revealing a part's pending failure, all should be recorded in the system and then scheduled and assigned for correction. Successfully executing this process across the organization is key to evolving from a reactive and unaccountable culture to a culture of accountability and high performance.

Implementation, Training, and Support

As you introduce a new application and new processes to your workforce, you must be cognizant of the change in culture you are about to drive. If this aspect of the project is not handled carefully and deliberately, no application you select will succeed, nor will you. The implementation process must be properly paced and supported by



management, and you must be sensitive to its impact on people. Change is hard, but if the change management process is executed effectively when rolling out a CMMS / EAM solution, you will be amazed at the positive effects it will yield throughout the organization.

It is important to consider the amount of training necessary for your crew to learn how to use the solution. Your CMMS / EAM vendor should offer a support framework for the initial system implementation, training, and on-going customer care. The implementation team should have experience with CMMS / EAM systems and maintenance best practices, as well as experience in

your industry. If you have to stop and explain your business to your implementation team, that can cause delays and have a negative impact on how the system is deployed. Having a trainer who is familiar with field operations and the job site will pay dividends. Expect the trainer to travel to the job site to deliver on-the-job training. This will save training costs overall, because people better absorb knowledge by using tools and technology in their environment, with their data. Face-to-face engagement builds a better rapport between the users and the trainer, and helps each of them gauge the comprehension level of the material and adjust accordingly.

To ensure you continue to get the most from your CMMS / EAM solution, look at vendors that offer consulting and services for assessment and problem analysis, solution definition, and implementation – from education and training to turnover and operations. Your provider should have the ability to deliver an operational system out-of-the-box to get you started, then learn your individual organizational needs and tailor the solution to meet your processes.

Mobility

Maintaining paper records on the rig can be frustrating, at best. Paper practices are fraught with risks, including lack of standardizations across the company and being highly susceptible to loss or inadvertent destruction. The easiest way to capture work execution is with mobile solutions as it occurs. Digitally tracking the work will reduce the chance of errors as information is captured in context, which will also mitigate your risks. Technicians are a valuable resource when they are on the rigs, so it's imperative they spend most of their time working on equipment and not dealing with paperwork. The ability to access and complete work orders on a smartphone or tablet will streamline the process and increase wrench time.

Mobile applications reduce downtime by improving communications and capturing the data needed to determine and correct root causes. The technician can be notified in real-time as route changes are made, rather than going back to the office to check a whiteboard. All of the information needed for him to complete the job safely and effectively is contained in the palm of his hand on his device. In areas where there is no WiFi or cell connectivity, a solution that can store and capture data offline is essential so that environmental limitations don't prevent you from driving improvements that a CMMS / EAM can deliver to your operation.

Functionality

The solution should offer functionality specific to the Oil and Gas industry, and the provider should have a deep understanding of your sector's unique needs and requirements. Be sure to choose a solution that can meet your needs today, as well as into the future. Today, you may be operating a run-to-fail approach and need a solution to help you simply open and close work orders. Eventually, though, you may be hoping to improve efficiencies and begin scheduling preventive maintenance work and ultimately move towards predictive maintenance. Your CMMS / EAM vendor should be able to grow and scale as your business needs evolve, and engage its customers to collaborate on the features that provide the most value to their operations.

Moveable Assets

Oil and Gas rigs operate as mobile factories with various systems and sub-systems comprised of many assets – these assets routinely move between divisions and repair facilities, and even between countries. To ensure



reliability, availability, and continued preventive maintenance activities, a complete history must follow each asset.

For example, drill pipe is a huge consumable in the upstream Oil and Gas industry. A string of pipe for a 25,000 foot well could be \$1.2 million per rig. The pipe and connections typically wear out as you drill through rock and various elements. As it comes to the surface, a rigorous inspection occurs to decide which pieces need to be reworked before their next use. These pieces are then trucked offsite to be repaired. However, the next drill site needs pipe, so the superintendent will call the yard to get 50 joints of pipe on trucks to another rig. One truck is going

to get reworked, one truck is going to back to the rig, and if you can't easily track the moving assets, you will be in a very costly situation, with pipes missing and rigs idle while waiting for pipe. Multiply that by 20 rigs, and the cost to your operations is enormous, not to mention a number of unhappy clients.

These valuable assets are not tracked by serial number, but need to be monitored to prevent loss. Transfer requests, approval processes, and receipt requirements within a maintenance solution, rather than paper documents on a shelf, effectively tracks these expensive assets. Having visibility into the location and status of this drill pipe, from an easily accessible EAM, can save time and money.

Oil and Gas operators need to use preventive maintenance strategies in unique ways as well. In addition to the typical time-based and usage-based maintenance, your CMMS / EAM should have the ability to track the operational days of a rig and schedule maintenance based on that data point. Traditional CMMS / EAM systems also do not consider the need to track the statuses of rigs and tie maintenance tasks to those events. For example, there may be a standard maintenance procedure which should trigger when a rig is stacked, or returned to, operational status. Without these preventative maintenance strategies in place, you aren't maximizing your asset performance which will have a negative impact on your overall operational efficiency and productivity.

Regulatory Compliance

Most inspections follow standards set by the American Petroleum Institute (API), and operators will audit the drilling companies based on these guidelines. With a paper-based system, the process is dependent on the manager's approach to paperwork – documentation may be filed incorrectly, it might be misplaced or forms might inadvertently end up in the trash. Digital event tracking within a maintenance management solution can capture compliance inspections, including internal checks and regulatory requirements specific to the Oil and Gas industry. This tracking provides an audit trail of all inspections and related corrective action in a central repository, easily accessible at any time, from any place, by anybody in the company.

Document libraries are also important for regulatory compliance. Because operations are often spread across multiple locations, it is necessary that policies, procedures, and findings are housed in a common system, accessible anywhere at any time. Document linking ties safety procedures, permits and personal protective equipment (PPE) requirements to relevant assets, reducing the technician's valuable time spent searching for or waiting on appropriate documentation.

Health, Safety & Environmental Requirements

Oil and Gas companies must ensure environmental and safety incidents are kept in check. There is a strong correlation between reliability and safety – a best-in-class maintenance solution will not only support reliability initiatives, but also provide additional functionality to support health, safety, and environmental (HSE) programs.

Event tracking capabilities allow users to enter any type of incident or event without requiring a work order. Each event type must have its own associated user-defined fields, which allows you to capture the information important to your processes. The solution should also feature follow-up work orders that enable users to automatically launch a separate but related action item to correct any deficiencies found, which they were unable to correct during the execution of their current work task.

Infrastructure and Deployment

Many leading CMMS / EAM providers have both on premise and cloud deployment options. Before you begin your search, you will want to have an idea of which option might work best for your operation. If you have an established IT footprint and a fully staffed IT department, on-premise may work for you. However, in today's climate – and particularly in Oil and Gas – most companies have taxed (if any) IT staffs and limited experience hosting applications that must be available anytime, from anywhere, as your CMMS / EAM will need to be. Thus, the current trend is to deploy applications in the cloud. As you consider this option, you will want a vendor who has a track record of successfully providing cloud solutions, and who has the experienced staff capable of providing a secure,

reliable environment. They should partner with a reputable tier 1 hosting provider. An annual SSAE 18 Type II audit is an important requirement you should have of your vendor. This industry standard IT audit is an independent audit process aimed at validating the strength of the company's internal controls and compliance with them.

KPIs and Results

As soon as you start to gather data with your new system, you will begin to ask questions of the data, such as “why does the pump on rig 12 break down more often than others?” An easy-to-use, visual, and configurable analytics solution is essential to capitalizing on your valuable data. No one in the field has time to write reports, determine KPIs, or wait on IT to help them mine the data. An intuitive analytics solution with metrics that end users can create, manipulate, and drill-down into themselves will accelerate your ability to generate results for your reliability program.

Comparing data across rigs and regions will help you identify areas where you should emulate good practices, and adjust poor ones. Being able to quickly, and in real-time, show data-driven results to the crews in the field can help boost the healthy competitive nature of the teams and improve adoption of the system.

Conclusion

Continuous operations place stress on Oil and Gas production equipment, increasing the risk for unplanned downtime and safety incidents. Organizations should seek out the ability to manage all assets from a single platform providing better control over costs and expenditures. If you're currently managing on paper, it's crucial to start small and make incremental changes. Get a few work orders entered, and achieve small wins. Once the results of those small changes are evident, work toward something bigger. Soon, the culture will completely change for the better, and the tangible results will greatly improve the company's efficiency, productivity, and ultimately the bottom line.

To learn more about how Apteian TabWare EAM can help improve your Oil and Gas organization's maintenance operations, contact Apteian at info@apteian.com or 855-411-2783. You can also visit us at <https://www.apteian.com/solutions/asset-management/apteian-tabware-eam/>

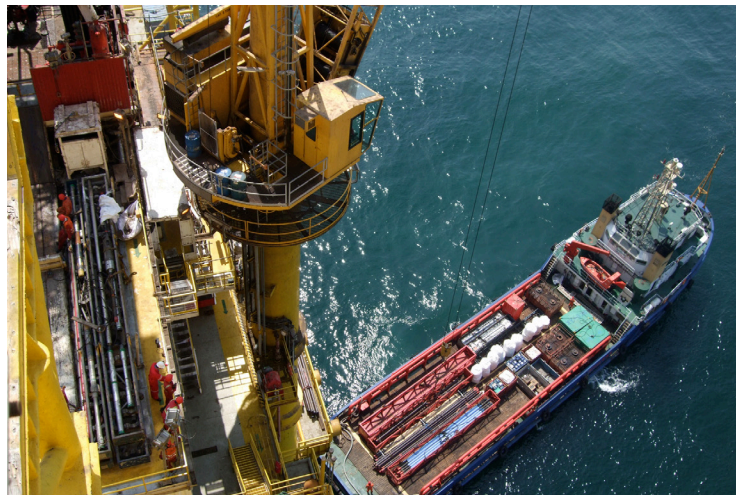


About the Author

Brad Charters is an experienced, results-oriented maintenance leader with a demonstrated history of achieving measurable improvements in rig uptime and reliability in the Oil & Gas industry. Brad's career has spanned from working as a journeyman to director roles with responsibility for the maintenance operations at service companies operating in North America and the Middle East. Brad's experience with managing the change in operator culture along with the implementation of rig maintenance best practices have enabled him to create sustainable world class asset reliability programs for successful Oilfield service companies. He has more than 25 years of practical and consulting experience in engineering, maintenance management, inspections, EHS, EPA compliance and maintenance and repair operations. Brad completed the Marshall Institute's Maintenance & Reliability Management program from North Carolina State University. He can be reached at Brad.Charters@outlook.com.

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Aptean provides very specific industries with very specific ERP, supply chain management and customer experience solutions. In today's fast-paced, highly competitive economy, organizations don't have time to waste forcing homegrown software, spreadsheets and one-size-fits-all solutions to do things they were never designed to



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Aptean TabWare EAM is a robust Computerized Maintenance Management Software/Enterprise Asset Management (CMMS/EAM) solution that helps Oil & Gas customers maximize asset performance, increase equipment uptime and reduce maintenance and operations costs, leading to increased profits and

ensuring product quality and throughput. TabWare was designed by maintenance professionals, and TabWare's heritage is in asset-intensive industries such as Oil & Gas, Discrete & Process Manufacturing, Food & Beverage, Chemicals, Mining & Metals. With one of the quickest adoption rates in the industry, Aptean TabWare EAM is easy to learn and use, leading to increased wrench-time and reduced keyboard time. To learn more about TabWare, please visit www.aptean.com and contact us at info@aptean.com.



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