ASSET INTEGRITY MANAGEMENT IN THE MIDDLE EAST

Learn from the region’s leading operators on how to improve asset integrity performance to optimise the commercial viability of assets, enhance safety and improve equipment performance.
OVERVIEW

Asset Integrity Management (AIM) is crucial for the oil and gas sector to ensure the reliability of operations and the safe delivery of production targets. While established in the Middle East for many years, emerging challenges such as high pressure high temperature and sour environments, means that AIM’s importance and influence is further expanding in the region.
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Asset Integrity Management in the Middle East’s Oil and Gas Sector

Successful AIM programmes incorporate design, maintenance, inspection, process, operations, and management concepts, across people, plants, equipment and other assets. And, in oil and gas, best practice operations have comprehensive, fully integrated systems and a culture directed at gaining greater lifetime effectiveness, value, safety, availability, profitability and return from production and manufacturing assets.

It is recognised by industry professionals that investment in AIM has significant business impact over the longer term by mitigating the financial, environmental and reputational risks that result from systems failures (by way of example, just think of the repercussions of the Deepwater Horizon oil spill in the Gulf of Mexico in 2010). However, in the Middle East, despite an increasing understanding and appreciation for AIM at the management level of oil and gas operations, AIM professionals still face a number of challenges that are peculiar to the region as they work to develop robust, world-class AIM systems and processes.

As the vast, conventional sources of easy oil and gas decline, many reservoirs are getting more complex, with a real change in recovery techniques, says Allan Grieve, Operations and Maintenance Manager, Joint Venture Excellence at Shell Development Oman.

He also highlighted how operators are also turning their attention to sour gas and high temperatures and/or high pressures (HTHP).

Infrastructure complexity: With skyrocketing global demand for oil and gas, the industry across the Gulf continues to expand. As such, Allan Grieve says this growth brings with it more infrastructure and a system in the Middle East that needs to be managed.

"Infrastructure in the Middle East is aging and becoming more complex; there’s a large amount of pipelines and flow lines...for example, if the number of flow lines here in Oman alone were placed end-to-end from Muscat it would reach all the way to Los Angeles. As we have more kit, it becomes a more complex job to manage it effectively over the lifecycle," he says.

Aging assets and equipment: Investments in supply and infrastructure technologies were made a long time ago, hence these aging assets are reaching maturity and the end of their technical lifetime. There is a need to further extend the life of these mature assets beyond their design life, while at the same time, ensuring safe and efficient operations, both of which can be difficult given the age of the assets and equipment.

Sour gas and HPHT: According to Scottish energy consulting firm, Wood Mackenzie, the major oil fields in the Gulf region have already pumped more than half their oil.

Assessing the Key Challenges for AIM in the Oil and Gas Sector in the Middle East

The GCC oil and gas industry has historically held a major share of the world’s energy supply and still contributes significantly to the growing global demand for oil and gas demand. In fact, the Arabian Peninsula has fuelled the global economy with oil for more than five decades.

As the industry here reaches maturity, a number of challenges are being faced by operators in the race for efficiency and profitability. We’ve discussed AIM with experts including Allan Grieve, Operations and Maintenance Manager for Joint Venture Excellence at Shell Development Oman, and Alan Bickle, Head of Operations at Oman Oil Company Exploration & Production LLC (OOCEP).

While the issue is not specific to the Middle East, a lower awareness level of AIM is more prevalent; partly due to a relatively transient international workforce of predominantly specialist contractors from disparate firms, and partly due to the fact that in the past, AI had not necessarily been high on the agenda of management boards here.

"We still have some work to do around instilling the mindset of AI into the industry; to have it inbuilt into the culture of operations so that it influences behaviours," he says.

Despite the challenge, Alan Bickle says the issue is changing, with a growing awareness at the corporate level of the long-term positive impact that AIM strategies can have on the business financially and reputationally.

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Allan Grieve, Operations and Maintenance Manager, Joint Venture Excellence at Shell Development Oman.
AIM & Design

As a relatively new operator in the region, with newly built plants, Alan Bickle says his firm, OOCEP, has had an advantage in integrating AI best practice into the business by addressing needs at the design phase. The investment illustrates the growing influence of AI on the corporate agenda in the Middle East and has created world class plants, that “have all the bells and whistles” needed for the successful delivery of AIM.

“AIM should absolutely be factored into the design of plants. In my past, when working for BP in the North Sea, we had AIM specialists in at even pre-feed to ensure that the right monitoring systems were in place and the right material selection was undertaken. The earlier in the design of a plant that AI is considered, the better,” he says.

Bickle argues that AIM is such a specialist area with regard to how and where operators measure their plants, that to have AI experts in early in their development can impact their design, thereby saving time and money in the long run because where corrosion and erosion is most likely going to take place would be assessed correctly, resulting in having monitoring probes located in the correct places.

“It’s much more difficult to put monitoring systems in place once a plant is operating. Post implementation is much more difficult – the risks are then that you didn’t do or you don’t do it properly, which means you have the possibility of unplanned problems, which can impact costs, safety, development and the environment,” he says.

Bickle says that as the AI industry and its influence further grows in the Middle East, the mindsets of operators will change and, as OOCEP has done, it will become standard practice to have AIM incorporated into the design of all new plants in the region.

For OOCEP, having AI designed into its plants was a priority. Now, it is about focusing on people and their behaviours.

Bickle says: “We’ve invested strongly in having AI well incorporated into the design of our plants, which are now world class. But, now it’s about moving on to the culture of the business and the mindsets of the workforce; the building in of AIM systems and processes.”

“The plant has all the hardware in place, and in the right place, to effective measure and monitor its operation. If you don’t consider AIM at the design phase then there’s always an element of doubt as to if you have the measuring and monitoring equipment in the right place. For us, it’s now about putting in the systems and processes to impact mindsets, culture and ultimately, behaviours.”

AIM & Compliance

Grieve says that AI should be treated as importantly in your business as personal safety; it has to have the correct leadership attention and understanding of how important managing AI effectively is. Our workforce and communities should be safe, both at work and at home.

He likens AIM’s procedural compliance, audits and assurance to that of a speedometer in a car; they are crucial and fundamental aspects for safe and effective operation, ensuring that you have a clear understanding of what improvements are required.

“The AIM industry here is helping to drive higher standards in the region and operators now increasingly understand that it costs far more to deal with a leak when it happens than it does to manage the asset effectively in advance,” he says.

“Businesses may try to scrimp and save but in the long term it can really hurt economically. For example, when the price of oil drops, people might stop painting, only to restart when the price of oil goes up again. But, regular measurement and maintenance is a must. You need to keep investing in AI for long term sustainable results. Short ‘termism’ and underspend will expose itself in the future as more corrosion and more leaks.”

While, measuring the performance of plants, equipment and other assets may be complex, with hundreds of thousands of items needing to be monitored and maintained, having the correct systems and processes in place ensures measurement is carried out effectively and efficiently, he says.

This is particularly important when you consider that in most hydrocarbon plants, more than one third of equipment is safety critical, the performance of which all needs to be measured, with maintenance actioned in a timely manner, where and when required.

For Grieve, AIM processes are about mitigating operational risk, across plants and people.

“AIM and measurement ensures that you know where you are. The risk of not undertaking effective measurement is that you have things happen to you that you’ve not predicted. You want to operate in a predictive environment, otherwise you won’t know that your safety critical equipment will be ready to perform when you need it,” he advises.

However, Grieve warns that AIM and measurement must not only focus on assets and equipment to be effective. People and their understanding and practice of AI systems and processes also need much investment of time.

“It’s about people knowing what they need to do, making people chronically uneasy and aware of the AI consequences of not getting it right, through training and simulations, so that they are constantly thinking about and are on the edge of checking AI performance and health,” he says.
The Future of AI in the Middle East

For Allan Grieve and Alan Bickle, there is no doubt that there will be a continued focus on AIM in the Middle East’s oil and gas sector. AIM will embed itself into all phases of assets’ life, from conception and design, through to operations.

As AIM continues to expand and professionals look to instil best practice in the region, Grieve suggests that other sectors, not just the oil and gas industry abroad, can bring lessons to bear.

“What I’ve found when it comes to AIM best practice is that you can find best practice within your own organisation and industry, in your own country and also in other sectors, such as the motor manufacturing and processing industries. The nuclear industry is also very good at AIM; it has to have robust AI systems in place. We can learn and improve from the other industries that are doing it better,” he says.

“What separates the best from the rest is that the best do the basics really well. It’s the guys who prepare and schedule according to plan. It’s the people that paint according to a painting schedule, who PIG the lines as they should, who select the right materials, and have effective and efficient operations and maintenance programmes.”

Grieve cites Toyota’s Lean process as a further example of AIM best practice that delivers efficiency and also improves safety. Essentially, lean is focused on making obvious what adds value by reducing everything else. It is a management philosophy derived mostly from the Toyota Production System.

Both Bickle and Grieve also agree that industry cross-learning and open dialogue between AIM professionals in the oil and gas sector in the region, through conferences and events, will further aid in the development of AIM best practice here.

Summary

As Middle East oil and gas companies seek to successfully navigate the fuel demands of the ever-changing global marketplace, AIM monitoring, measurement and management is crucial to help improve reliability, ensure safety and asset protection. Effective AIM programmes should be implemented during design and included in maintenance, inspection, operations, and people management.

As AIM in the oil and gas industry looks ahead to grow and expand its influence, this will be best done through the sharing of best practice, in the Gulf and internationally, so that oil and gas operators will be able to maximise operations and mitigate challenges.

“Allan Grieve, Operations and Maintenance Manager, Joint Venture Excellence at Shell Development Oman.

“It’s about making best practice common practice”
Join Orpic, Dubai Petroleum, Daleel Petroleum, ADMA, GASCO, ExxonMobil Research Qatar, Doosan, DNV GL and many more to share learnings and best practice to improve asset integrity performance at the 10th Annual Asset Integrity Management Summit taking place from the 1 – 4 March 2015 at the InterContinental Muscat Hotel in Oman.

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