



Project Summary

Organization:

Oman Gas Company S.A.O.C.

Solution:

Utilities and Industrial
Asset Performance

Location:

Al-Khuwair, Muscat, Oman

Project Objectives:

- Digitize the reliability and integrity program and establish digital workflows for equipment inspections.
- Manage all elements of asset performance and integrity within a single platform.
- Automate asset reliability and maintenance functions to minimize human intervention.

Products used:

AssetWise Asset Reliability

Fast Facts

- AssetWise provided a single platform for risk-based inspection program, analysis, and inspection data management.
- Previously manual performance calculations are now automated in AssetWise.
- Workflows and approvals are streamlined and support timely and accurate decisions.

ROI

- AssetWise provided a connected data environment and established digital workflows that reduced equipment failures and improved reliability performance by 9 percent.
- Leveraging the capabilities within AssetWise, OGC optimized maintenance and operation costs.
- The successful implementation of Bentley's technology transformed OGC's approach to asset management from reactive to proactive, significantly impacting revenue and profitability.

Oman Gas Company Digitalizes its Reliability and Integrity Program

Bentley's AssetWise™ Reduced Equipment Failures and Improved Reliability Performance by 9 Percent

Committed to Operational Excellence

Established in 2000, Oman Gas Company (OGC) is the principal gas transportation company in the Sultanate of Oman. OGC operates a 2,500-kilometer, high-pressure gas transmission network spread among more than 40 facilities, including three compressor stations and 38 gas supply stations that run the length and breadth of the Sultanate. With annual gas transmission volumes of around 21.549 billion cubic meters, the company distributes gas to 4.4 million people, as well as to the majority of the Sultanate industrial sectors, from power and desalination plants, to fertilizer, methanol, petrochemicals, refineries, and cement plants. Truly "powering the nation," OGC must ensure reliable product availability.

The Challenge

The company's small reliability team manages the performance and reliability of the numerous plants and widely distributed assets throughout Oman. These engineers conducted manual performance calculations for reliability and availability using manually collected data stored in disparate databases. With scattered data, lack of resources, and manual processes prone to human error, OGC recognized the need to initiate an advanced reliability and integrity program to achieve operational excellence as a world-class, midstream gas value chain company.

A Connected Digital Solution

To eliminate human fault analysis and improve resource effectiveness, OGC sought to digitize and automate all data and processes within its reliability and integrity program. The company determined that Bentley's AssetWise Asset Reliability was the most cost-efficient technology solution that also allowed the entire framework to be managed and maintained within one platform.

OGC began the digitalization process in 2017, working with Advisian, a top consulting firm, to implement AssetWise and support their advancing processes and practices to maximize asset value and maintain safe, secure, and reliable operations.

The integrity framework features risk-based inspection workflow and supports an integrity database management system, including calculation of remaining asset life. Bentley's interoperable technology is integrated to operational technologies like OSIsoft PI, as well as enterprise asset management system SAP EAM for work execution. Integration of AssetWise asset performance management to SAP is an important part of OGC's digitalization strategy. OGC captures full, partial, and potential failure data from the maintenance work completed in SAP to update the reliability and integrity program in AssetWise. With this closed loop process, OGC achieves a living and continuously improving program. The asset performance management system serves as the basis for calculating overall equipment effectiveness (OEE), identifying bad actors, performing root cause analyses (RCA), and eliminating defects. Tracking key performance metrics in AssetWise dashboards has ensured adherence to process and has assisted in shifting the work culture to be more proactive and reliability-focused.

The flexibility and interoperability of AssetWise Asset Reliability enabled OGC to consolidate and analyze all condition monitoring and operation maintenance data from manual and Internet of Things (IoT) sources, providing visibility into condition degradation trends and critical health parameters for proactive maintenance. Having a centralized system using AssetWise, OGC established digital workflows, streamlining all processes within its reliability and integrity program and accelerating accurate communication and equipment analysis to facilitate timely maintenance and optimize asset reliability.

Automating Reliability and Integrity Processes

OGC automated several reliability and integrity processes that were previously completed manually by a reliability engineer using Excel spreadsheets. With the software, all reliability-related analyses, approvals, and associated recommendations from bad-actor analysis, RCA, reliability-centered maintenance (RCM), and risk-based inspections (RBI), are automatically performed. Now, the system is configured to calculate weekly reliability and availability

“The auto-alert notification in Bentley’s AssetWise has been a key enabler, helping us to improve our reliability at a significant rate of about 9 percent a year.”

– Fahmi Reza, Head of Reliability and Condition Monitoring, Oman Gas Company

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of individual assets, in series and in parallel, based on an exponential reliability model. The software identifies the bad actor equipment and uses that information to perform RCA. The application also triggers alerts and emails recommendations and reminders to the appropriate personnel until the corrective work is implemented.

If a due date is approaching, AssetWise automatically sends the line manager a notification, establishing accountability at every level. This approach significantly increased equipment reliability because implementing recommended changes is the most important aspect of RCA. Similar automated workflows for equipment criticality analysis and reliability-centered maintenance were also integrated as part of the reliability digital framework.

Having a digital, automated framework to manage asset reliability and integrity has eliminated human fault analysis, improved resource effectiveness, and facilitated a proactive approach to asset maintenance, ensuring all anomalies are identified and rectified by the appropriate personnel. The AssetWise system increased reliability performance by 9 percent, which is worth significant savings to OGC.

Integrating Handheld Devices

As part of its automation and digitization efforts, OGC integrated handheld devices for routine operator duties to help bridge the disconnect between the engineers and the field operators by mapping trends, monitoring operational parameters, and providing necessary remote technical support. The introduction of barcodes and handheld devices interlinked with AssetWise enhances quality in the field and ensures reliability, availability, and maintainability of the facilities. Operator readings and first line maintenance (FLM) are remotely recorded and automatically uploaded from the mobile devices to AssetWise to update asset health performance.

Clear visibility to current asset health, degradation trends, and historical performance on dashboards makes the day-to-day work much easier for reliability and maintenance professionals. Additionally, the interoperability and connectivity established proper digital workflows and standardized processes to promote safety, quality, and accountability in the field.

Utilization of handheld devices as part of the reliability and integrity system ensures that operational key performance indicators (KPIs) are achieved through regular monitoring of the equipment compliance status. If any value is out of range, similar to other automated procedures, AssetWise triggers an alert and an email notification. This certifies that all anomalies for each asset at every facility are noticed by the appropriate operational and maintenance personnel, and potential problems are rectified through timely and planned corrective actions. Integrating handheld devices increased reliability performance, reducing the number of breakdowns and improving the execution of routine duties by operators.

Successful Digitalization of Processes Drives Cultural Change

The successful implementation of AssetWise as the digital solution for OGC’s reliability and integrity program has driven a cultural transformation toward asset performance from a reactive to a reliability-centered approach. Fahmi Reza, head of reliability and condition monitoring at OGC, obtained his Certified Reliability Leader (CRL) designation from the Association of Asset Management Professionals (AMP), leveraging the Uptime Elements Framework to help with reliability cultural awareness. He leads the transformation and stays on top of important priorities set by the company. Reza initiated operators’ training and created awareness for reliability as a culture among all stakeholders in the organization.

Using the AssetWise dashboard to digitalize and share asset information ensured focus on adherence to process with accountability and continuous improvement built-in. The transparency of information motivated the people in each plant to internally compete for better reliability performance and management than their sister facilities.

With a top-down commitment to synergize all resources to support digitalization using AssetWise, OGC has moved from time-based maintenance to a risk and reliability focused strategy, supporting its vision to achieve operational excellence. Bentley’s asset performance management application has significantly impacted OGC business. With reliability-centered maintenance now at the forefront, OGC is prepared to move into Industrial 4.0 Digitalization by 2024 using AssetWise as the digital platform supporting this goal.