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End to End Corrosion Management Digitalization

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Abstract

The primary objective of the project was to digitalize the Corrosion Management (CM) system within the Asset Performance Management (APM) platform for oil and gas facilities, both offshore and onshore. The aim was to enhance process efficiency by reducing human intervention and error, and to provide a more robust and comprehensive data management system. The scope included the implementation of a new digital CM platform that integrates all recorded CM data, enabling direct and comprehensive analysis through predefined KPIs. This system is intended to monitor and evaluate the performance of corrosion controls continuously. The new CM solution was implemented on a digital platform that includes handheld devices programmed to interface with the existing computerized maintenance management system (SAP). Technicians use these devices to collect data directly from barcoded equipment at specific TAG locations. This method allows for immediate data entry and upload into the APM software, reducing the need for manual data recording and entry. The platform utilizes a series of check sheet templates that list necessary indicators, ensuring that all relevant data is captured accurately and consistently. The following are the categories of KPI used to ensure CM performance for Oil and Gas Facilities: Internal Corrosion Management: these KPIs defines the internal corrosion information and ensure reporting on timely manner, and External Corrosion: these KPIs defines the external corrosion information related to Cathodic Protection and Coating. The digitalization of the CM system has resulted in significant cost savings, approximately 127K USD annually, by reducing time spent on-site by contractors and staff, and minimizing paperwork. The reduction in manual data entry has also decreased the likelihood of errors compared to traditional paper-based methods. Furthermore, the system has improved the tracking of pending issues and concerns arising from site findings, facilitating more timely and effective responses. This digital CM solution is unique in its integration of handheld devices with existing maintenance systems, which has not been

previously recognized in the market. It has been nationally and internationally acknowledged, receiving appreciation from several clients, and has been recommended for broader implementation. The digital solution not only provides end-to-end digitalization but also innovatively enhances the corrosion management process, making it a pioneering initiative in the field.

Keywords
Corrosion Management, Digitalization, Digital Twin, Oil and Gas

Biographies
Eithar Al Ghazali is a skilled professional in asset integrity and reliability management, with expertise in materials and corrosion control, particularly in upstream facilities. They have contributed to corrosion monitoring, materials selection, and the implementation of an Integrity Operating Windows (IOW) program for internal corrosion management. Their work also includes digitalizing cathodic protection in Asset Performance Management (APM) software. Previously, they served as a process engineer at Sohar Refinery, managing crude and vacuum distillation columns and overseeing pre-turnaround activities. With a strong background in refinery equipment operations, they have completed internships at OQ refinery. She holds a bachelor's degree in Chemical and Process Engineering from Sultan Qaboos University, with certifications in cathodic protection, corrosion ethics, and non-destructive testing methods.

Nawras Al Jabri is Specialist in Materials and Corrosion Engineering with background in Chemical Engineering. She worked in OQ since 2019 in the field of Materials selection, corrosion management, and asset integrity. Her area of expertise are cathodic protection, integrity operating windows monitoring and management. She presented different topics related to Corrosion management nationally and internationally. She attended different leadership programs including the Royal Academy of Management – Future Leaders.

Yahya Al Bulushi is Chartered engineer working as Materials, Corrosion, and integrity professional in oil and gas for the last 12 years. He possess full round competency in his field with different roles as technical expert and in leadership positions. Has various certificates from AMPP and API related to Damage mechanisms, Cathodic Protection, Welding, and Inspections. He holds Mechanical Engineering Degree from SQU and Data Science MSc from GCET.