

ABSTRACT

Title: Findings from auditing Pipeline Integrity Management Systems (PIMS)

Pipelines are critical infrastructure with high costs of construction and potentially catastrophic consequences of failure. As these assets age, the degradation mechanisms progress to a point where maintaining their integrity must be proactively managed. Industry best practice specifies the implementation of a specific Pipeline Integrity Management System (PIMS). This is a comprehensive, systematic, and integrated set of arrangements implemented by an operator to assess and manage pipeline related risks.

Over the past 18 years, Penspen have developed and performed over 30 PIMS audits of pipeline operators internationally and undertaken research on the root cause of failures. As part of this work Penspen has examined and identified the common shortfalls and gaps in operators' PIMS arrangements, in accordance with best practice. Penspen has also developed a standardized 17-element PIMS Model based on its experience from audits as well as recommendations from codes and standards. The Model is used to audit, benchmark and assess an operator's PIMS arrangements, to manage risks to people, the environment and to the business, to acceptable levels, given the anticipated pipeline operating conditions and considering the pipeline's history and current status.

The PIMS Model also considers the adequacy of operators' pipeline policies, objectives, performance metrics and how these are subject to monitoring, review, and audit. Organisations responsible for managing the integrity of pipelines are also assessed to determine how individuals with a role to play in the wider PIMS work together. The paper discusses how risk assessment results are used to determine the control and mitigation measures to be implemented during the pipeline's design, construction, handover, commissioning, operation, inspection and maintenance, and how the operator ensures the effectiveness of these measures. The PIMS Model contains 'supporting' processes and systems, which play an important part in pipeline integrity management, including procurement, emergency response and repair, incident investigation, change control, document and data management and legal and code compliance.

The collated results from the 30+ audits reveal that while operators typically have good control systems in place for the project stages of the pipeline lifecycle, controls for the operational stages have been found to be less robust. In terms of management and organisation, operators can fail to recognise how many different individuals and teams have a role to play in the management of pipeline integrity. Furthermore, while operators often have good corporate systems in place for change control, emergency response and risk assessment, such systems may not consider pipeline-specific risks or requirements. Operators can tend to focus on pipeline safety and/or environmental-related risks, when through holistic assessment it can be shown that risks associated with production interruptions will tend to drive actions in practice.

Biography

Ali is a chartered engineer who has worked in the oil and gas industry for 10 years, since completing his MSc in Pipelines Engineering from the University of Newcastle. He manages Asset Integrity for Penspen in Abu Dhabi, covering the Middle East and Asia Pacific regions. His role focuses on engineering assessments and management aspects of pipeline integrity, including defects evaluation and repairs, risk based inspections, development of integrity management systems and strategies for international oil and gas operators.