

CORROSION MODELLING AND MACHINE LEARNING

Accurate knowledge of corrosion location, severity, cause and growth rate is critical to pipeline integrity, and in-line inspection (ILI) is widely regarded as the most reliable and convenient method of obtaining such knowledge. However, when ILI data are lacking or unattainable, operators must seek alternative ways to monitor the integrity of an asset. For managing internal corrosion, Internal Corrosion Direct Assessment (ICDA) is perhaps the best known alternative. ICDA employs the engineering analyses of corrosion and flow modelling to identify areas at high risk from internal corrosion. The highest priority areas are excavated and directly examined in order to establish the condition of the pipeline. This combination of corrosion and flow modelling can be used to provide detailed corrosion predictions, but in the absence of ILI data, selection of excavation sites can be problematic. The inherent randomness and uncertainty in the models means that the outputs must often be overly conservative; consequently ICDA can be a costly process, with no guarantee of quality. The shortcomings of ICDA (and related methods) create an opportunity for a more reliable and accurate corrosion prediction solution using machine learning which does not require a pipeline to be inspected using ILI.