Predicting the external corrosion condition of uninspected pipelines

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ROSEN has recently expanded its predictive analytics capabilities by adding a powerful new service to its portfolio. This service is specifically designed to deliver an accurate prediction of pipeline integrity with respect to external corrosion. It provides rapid, reliable screening of onshore pipeline networks, enabling targeted detailed studies and inspection. Particularly effective for unpigged or unpiggable pipelines, this service leverages a comprehensive database of corrosion features from pipelines worldwide, known as the Integrity Data Warehouse (IDW).

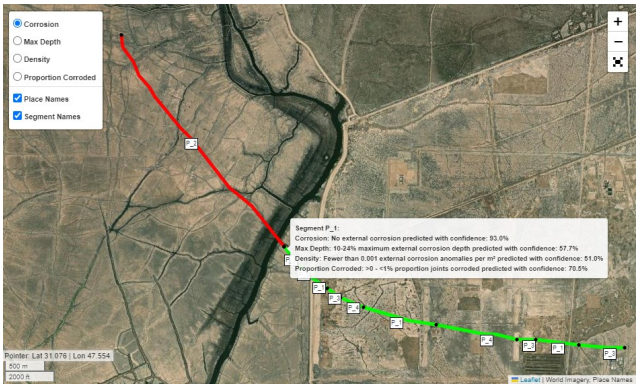
ROSEN's IDW is a robust repository, holding data from in-line inspections of over 26,000 pipelines, covering more than 800,000 km across various global locations. Geospatial data provides additional insight into the characteristics of the local environments of inspected pipelines in the IDW. These global geo-enrichment data is applied to each pipeline in our database and includes soil properties, land usage information, temperatures, and precipitation levels and the intersections of pipelines with relevant infrastructure such as roads, railways, powerlines, and waterways. This extensive data provides ROSEN with an unparalleled, broad picture of the condition of a significant portion of the world's piggable pipeline assets. The assets vary across multiple dimensions, including age, coating, diameter, wall thickness, and of course environment. Our expertise in machine learning, combined with this extraordinary dataset, empowers us to extrapolate trends from these inspected lines. We can then make accurate predictions about the integrity of completely unseen pipelines. Our meticulous approach to model training, testing, and validation ensures the models we use provide realistic and reliable predictions.

Our predictive services complement the existing pillars of inspection and monitoring, thereby emerging as the third critical pillar of pipeline integrity assessment. This innovation can help to improve safety and optimize operational expenditures. Currently, our service offers predictions on key asset integrity parameters such as:

- Corrosion Depth: Estimating the depth of corrosion
- Corrosion Density: Quantifying the severity of corrosion within the pipeline.
- Number of Joints Corroded: Providing a count of pipeline joints affected by corrosion.

This capability is versatile and provides results either at the pipeline level – with a single set of predictions for an entire pipeline – or on a segmented basis. When operating at a segmented level, a combination of geospatial and pipeline data is employed to offer more granular predictions for specific sections of a pipeline providing insights into those segments that are in good and bad condition.

Through this external corrosion predictive analytics service, we equip operators with vital predictions about the density and severity of external corrosion. This supports critical decisions regarding repairs, deferment, mitigation, and the prioritization of inspection runs or above-ground surveys. The service is conveniently accessible via a user-friendly dashboard solution with powerful visuals. Additionally, predictive analytics is available as part of an integrated solution to enhance other integrity management decision making processes such as ECDA, remaining life assessment, integrity management planning, and risk assessment. This integrated approach has already been successfully deployed across various pipeline networks, demonstrating its effectiveness and utility in the field.



Picture 1: Map of pipeline with predicted corrosion