

# Predicting Pipeline Performance

## BACKGROUND

AESL specialise in predicting the structural performance capabilities and deterioration rates of pipelines. These predictions assist customers in focusing maintenance and expenditure, minimising failures and maximising asset life. Predictions for long lengths of pipeline are based on the assessment of 1 metre lengths of pipeline at random locations.

Statistical analysis and stress modelling is used to relate the results from localised assessment to long lengths of pipeline. The process is used on:

- Individual pipelines to identify sections 'at-risk' of failure
- Critical sections of pipeline, to minimise the risk of failure (bridge crossing, tunnels, supply pinch points etc)
- Pipeline networks to aid optimisation of maintenance and replacement expenditure



## LOCATIONS FOR INSPECTION

The randomly selected inspection sites must be chosen from a representative population in terms of corrosion drivers (soil chemistry and water content) and corrosion protection (coating, liner and active CP).

An initial pipeline survey, to identify pipeline sections expected to exhibit similar deterioration, can utilise various techniques:

- Ground formation assessments using soil maps
- Identification of water courses, pipeline features etc. by route walking
- Assessing coating quality variations using above ground surveys



Representative locations for pipeline assessment can then be defined.

## PERFORMANCE PREDICTIONS

Performance predictions are based on identifying the extremes and patterns of alternative leakage and structural defect types. Inspection and statistical predictions are targeted to identify the current and future population of these defects.

The influence of the pipe wall coating is used in the prediction of current defect patterns and future deterioration. Calculated corrosion rates are used to predict future pipeline performance.

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