

EMPIRICAL POTENTIAL-DEPENDENT CORROSION RATE FOR UNDERGROUND PIPELINES

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ABSTRACT

Variations over time of the pipe to soil potential are expected to cause variations in the corrosion rate of underground pipelines. It is likely that external corrosion defects grow faster during periods when the potential is less negative. This paper will present a model for this potential-dependent corrosion rate.

The model is fully empirical, based entirely on data from pipelines in the Netherlands. It follows from matching the depths of external corrosion defects, as determined by pigrun inspections, to the history of ON potentials that the corresponding pipeline section has experienced over its entire lifetime until the moment of inspection.

The resulting model is applicable to forecast future corrosion growth based on ON potentials, as well as to estimate the maximum corrosion depth on pipelines in the Netherlands that have not yet been inspected.