

*AC corrosion modeling experience: lessons learnt*

Christophe Baeté  
Elsyca n.v.  
Vaartdijk 3/603, 3018 Wijgmaal, Belgium  
[christophe.baete@elsyca.com](mailto:christophe.baete@elsyca.com)

AC corrosion on buried pipelines is a complex phenomenon that received many attention the last decades. The reaction mechanisms occurring on the coating defect surface are more complicated than under simple cathodic protection conditions.

The assessment of AC corrosion likelihood (e.g. EN15280) is mainly based on many experimental data obtained on coupons and probes installed in the field or in laboratory set-ups. Although the main conditions under which AC corrosion may occur have been defined, there is still a significant amount of cases where AC corrosion is not as predicted. Coupons and probes do not provide sufficient information for explaining the reason for this discrepancy.

In 2009 a time-dependent numerical model was proposed that includes the relevant electrochemical reactions, the formation of corrosion and passive film deposits and the change in soil composition inside a coating defect of given size. The software was used in several research projects with the aim to explain more in depth the AC corrosion mechanisms that occur under known AC interference and CP conditions.

This article discusses the AC corrosion modeling experience gained over the years of AC corrosion assessment. Lessons learnt from modeling of real-life pipeline and coupon data will be summarized.

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