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Alternating current corrosion of pipelines and the geometrical aspects of the corroded steel surface

Based on criteria mentioned in EN ISO 18608 German technical rule DVGW GW 28 B1 (A) (2018) provides algorithms to assess the alternating current corrosion risk of high voltage interfered pipelines. One key element is the geometry of the corroded steel surface in combination with the associated defect in the coating. Because EN ISO 18086 – criteria are based on current densities it can be concluded that corrosion may proceed under the extension (depth, width) of the corroding steel surface while current density decreases. This concept comprises some implications with regard to the geometry of the corroded steel surface that has to be expected depending on (beside the impact of AC-voltage, cp-on-potential and soil resistivity) the size of the coating defect and also on the used type of coating. The paper proposes the relevant mathematical equations and shows the conclusions that can be drawn regarding the depth and width of corrosion pits. The results are discussed against the background of corrosion found on high voltage interfered pipelines.