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Pipelines Corrosion Due to the Electromagnetic Pollutioncaused by the High Voltage Power Lines

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Abstract: This paper studies the effect of the electromagnetic pollution caused by the high voltage powerlines on the corrosion of the buried pipeline. In this objective, the finite element method (FEM) was used to calculate themagnetic field distribution and the induced current densities in the buried pipeline caused by both horizontal and vertical configuration of the HVPL during steady state conditions. Inorder to diagnose the effect of the electromagnetic pollution on the corrosion of the pipeline, the electrochemical spectroscopy (EIS) measurements were used to characterize the corrosion polarization properties of X70 steelin simulated soil at various AC current densities. The results what, the electromagnetic pollution caused by the highvoltage power lines affect the electrochemical characteristics of the X70 steel pipeline and accelerate the corrosion of the pipeline.

Keywords : Electromagnetic pollution, high voltage power line, induced current density, X70 steel pipeline, corrosion, Finite Element Method, Electrochemical impedance spectroscopy