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Diagnosis of AC corrosion on the buried pipeline due to the high voltage power line

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Abstract: This paper studies the electromagnetic effect of the high voltage power line on the X70 Steel pipeline and the factors affecting this interference. The induced voltage onto the pipeline was calculated for different separation distance between conductors, the existence of the earth wire, separation distance between transmission line and pipeline and the parallelism length. The induced AC current density was calculated function to the induced voltage, the soil resistivity, and the holiday diameter. The electrochemical characters of the X70 steel with and without influence of the alternating currents were studied in simulated soil solution. The results indicate that the AC density accelerate the corrosion degree of X70 steel in simulated soil solution comparing with that in the absence of the AC density.

Keywords : Power lines, interference, induced voltage, induced current density, AC corrosion.