

Study on the Relationship Between AC Interference Levels and Corrosion Rates of Buried Pipelines Through Buried Coupon tests

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Abstract The on-site inspection and buried coupon experiments were conducted on two long-distance pipelines running parallel to high-voltage transmission lines. The investigation revealed that pipeline 1 has a parallel distance to the transmission line of less than 400 meters, with a parallel length of approximately 17.5 kilometers, while pipeline 2 has a parallel distance of less than 100 meters, with a parallel length of about 3 kilometers. Five locations of the two pipelines were selected to buried corrosion coupons, and the AC and DC parameters of the pipelines were monitored continuously for 24 hours. After three months, the corrosion morphology, corrosion products and corrosion rate of the specimens were obtained. The correlation between AC interference parameters, cathodic protection parameters, and corrosion behavior was further analyzed. The results indicate that the polarization coupons at test points 1# and 2# showed the alternating current density of above 200 A/m² and a corrosion rate higher than 0.1 mm/y, whereas the polarization coupons at test points 3#, 4#, and 5# exhibited a relatively low corrosion rate of about 0.03 mm/y. Macroscopic observations of the corrosion morphology indicated that the coupons experienced uniform corrosion.

Keywords AC interference, buried pipeline, corrosion rate, corrosion products

Reference

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