

MONITORING THE DEGREE OF CATHODIC PROTECTION FOR METAL STRUCTURES AND PIPELINES USING COUPLED MULTIELECTRODE ARRAYS SENSORS

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Abstract

Coupled multielectrode array sensors (CMAS) have been used for corrosion monitoring for cathodically protected systems. The evaluation of the effectiveness of the cathodic protection (CP) with the CMAS is by using the measured corrosion rate or corrosion current. When the corrosion rate is low or zero, the CP is effective. However, the CMAS was not able to indicate the degree of protection or cathodic protection safe margin (CPSM). This paper describes a new method to derive the CPSM from a CMAS to indicate how safely a pipe in soil or a metal structure in an electrolyte is cathodically protected and how to determine the optimum range of cathodic protection based on the signals from the CMAS. Compared with the conventional CP criteria based on the pipe-to soil potential measurements, this new CMAS monitoring method does not require a reference electrode and the probe is maintenance free and has extremely long life (over 40 years).

Keywords: Coupled multielectrode array sensors, CMAS, Cathodic protection, CP safe margin, CPSM