

THE PROTECTION POTENTIAL – WHAT IS THE EVIDENCE?

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Abstract

The long-established target potential for the cathodic protection (CP) of steel has recently come into question. This has given rise to fundamental reassessments of the mechanism, or mechanisms, of CP. Workers have interpreted protection in terms of polarizing the structure into either the immune or the passive zone of a Pourbaix diagram. Present thinking leans towards passivity. This paper presents a re-examination of the models of cathodic protection. It advances, or rather it restates, the proposition that neither immunity nor passivity are relevant. It argues that protection is simply a consequence of a potential-driven lowering of the anodic dissolution rate. However, it also emerges that elucidating any mechanism convincingly requires dependable experimental data on the very low corrosion rates occurring on cathodically polarized specimens. A critical review of published data points to a lack of reliability in this area. Suggestions for future experimental work are put forward.