ABSTRACT

Corrosion is the major cause of degradation in industrial plant and structures; the consequence of not identifying serious corrosion can be severe, however there are many methods for its evaluation and monitoring in addition to the obvious visual inspection. Three methods are described in this paper together with a summary of their application and limitations. The first is acoustic emission, which is listening to the process of corrosion itself, which produces AE as a result of the fracture and de-bonding of expansive corrosion products, localised yielding, or micro-crack formation. This method is applied to reinforced concrete structures, storage tank floors, and process plant whilst in service. The second method, ultrasonic imaging, is not particularly new, but what is new is the speed at which structures, including complete ship hulls, may be scanned using modern instrumentation, at rates of up to several square metres per minute. The third, commonly called long range ultrasonics, has several sub-sets, including guided-waves for the long-distance inspection of insulated pipe and road crossings, and methods for shorter distance inspection of the annular ring on storage tanks from the outside, and other similar “difficult access” applications.