Development and Testing of Corrosion Rate Monitor Based on CMAS Technology

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Abstract This paper introduces the development and testing of an online local corrosion rate monitor based on Coupled Multi-Electrode Array System (CMAS) technology. During the design and development process, requirements such as data acquisition, communication frequency, power supply, and storage were thoroughly considered. Additionally, the design and verification of the Zero Voltage Amperometry (ZVA) system were completed to ensure its accuracy meets the range of corrosion current measurement. Furthermore, the structural design of the probe was optimized to guarantee the accuracy of electrode arrangement, the reliability of electrical connections, and the sealing of the probe. Tests conducted in 3.5%wt NaCl solution demonstrate that the developed CMAS monitor can accurately reflect the changing trends of corrosion rates, achieving online monitoring of local corrosion.

Keywords CMAS; Local Corrosion; ZVA; Online Monitoring