ABSTRACT

The everyday use of metal in the field often changes to rust or corrosion, causing its user adverse effects. Iron metals are often used because of their superior strength, yet they are susceptible to corrosion. Corrosion is a chemical reaction that causes the reduction of metal electrons as a result of being in more oxygenated environments. In this study designed metal protection systems from corrosion monitoring by utilize IoT (Internet of things) using cathodic protection (ICCP and SACP).

This corrosion protection method comprises ICCP (Impressed Current Cathodic Protection) with currents to anode inert carbon, while SACP (Sacrificial Anode Cathodic Protection) use another anode as Zn (Zinc) as a sacrificial anode. To make use of IoT, readings from voltage sensors and current sensor are relented to ESP32 as microcontrollers capable of processing data and delivering to the ThingSpeak database. The system can be monitored through websites and android applications, along with LCD for direct monitoring. The monitoring contains the value of both current and voltage values, the voltage values change on the iron metal affects the metal condition itself, where the potential is protected between 0.85V-1.2V. It can transmit the status of metal conditions where it is protected, protected, and overprotected determined from potential iron metals.

An iron metal measuring 4.5cm x 7cm x 0.1cm is used in this study on both cathodic protection methods, with testing of our freshwater and seawater environments, which are monitored for 360 minutes. This test is compared with those who do not use any protection, with both protections producing a potential value increase in ICCP has a final value of 1,23V in freshwater and 1,27V in seawater while at SACP has a final value of 1,04V in fresh water and 1,22V in seawater. This cathodic protection has slowed the process of corrotion to iron metals by taking data from monitoring for 360 minutes, and it has been shown through website and andriod applications of line charts, metal status, and potential value of iron metals making it easier for the user to monitor everywhere.

Keywords: Corrosion, ICCP, IoT, *Monitoring*, SACP