

## ABSTRACT

Metal is the element that are often used in the industrial process, but this element has one of the disadvantages, which is that it can experience corrosion. Metal pipes that are subject to corrosion will cause gas or oil leaks so that they can cause fires. To prevent such events, a system that can prevent corrosion is needed and is monitored remotely utilizing the *Internet of Things* (IoT). The metal to be tested in this study is iron.

In this study, we will design a *prototype* system for corrosion prevention in metals. The designed system will utilize the *Impressed Current Cathodic Protection* (ICCP) method. This method utilizes electrons from a voltage source connected to the metal so that it can replace electrons detached from the metal. For the corrosion monitoring system on metals will use the IoT concept so that users can monitor at any time through smart devices.

The system is designed using Arduino Uno, NodeMCU ESP8266, current sensor, voltage sensor, PWM module and IoT platform. The result of the designed system is that it can provide metal protection from corrosion through the ICCP method by keeping the potential value of the metal between 0.85 V to 1.2 V in some environments. Users can monitor the condition of the metal through graphic data accessed through smart devices. When the metal is in an unprotected state and subjected to corrosion, then the graphic display on the user application shows the potential value of the metal below the standard. This research is expected to be a solution to the problem of corrosion prevention and monitoring.

Keywords: Corrosion, Iron, IoT, ICCP, Potential