

## ABSTRACT

In general, flashover is caused by pollutants and wet conditions that are not clean. This isolation failure can be caused by partial discharge (PD) which is left for a long time. PD activity is initiated by sticking, wetting, and drying of non-uniform pollutant layers so that the layer resistivity increases in certain areas. This causes the dry band so that the electric field strength becomes even greater. The strong electric field strength can cause arcs. If this condition is left for a long time, then the arc will develop until it reaches the entire surface of the insulator or called a flashover. This capstone project aims to design early detection devices and measuring the level of danger (severity level) of PD activities and acoustic-based partial arc so that flashovers on high voltage networks can be prevented. This tool uses the Internet of Things (IoT) system for online monitoring. The hardware in the IoT system consists of acoustic sensors, sound cards, and computers. The IoT system uses an online database in the form of a realtime database service by Firebase. The information system design tool uses a website-based javascript programming language. The detection system is designed according to the limitation of the conditions at the DTETI FT UGM High Voltage Engineering Laboratory. The test was carried out on a string isolator composed of 10 porcelain insulators which were wet uniformly. Tests carried out until the phenomenon of PD, partial arc, and flashover. Based on the test results, this tool is not only able to detect and measure the danger level of PD and partial arc, but also to monitor. Characteristics of acoustic signals emitted by PD and partial arc. The characteristics of PD signals are obtained through magnitude (dBA) analysis in the frequency domain. While the characteristics of the partial arc signal can be known from the analysis of the acoustic sensor output voltage surge (RMS) in the realm of time. Detection results from PD and partial arc are displayed in three color indicators namely green when there is no PD and partial arc, yellow when there is the only PD, and red when there are PD and partial arc. Also, this tool can display a magnitude PD chart (dBA) to the time and number of partial arcs every 15 second.

**Keywords:** Acoustic, flashover, frequency, internet of things, partial discharge, partial arc, sensor, sound card.