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UNDERGROUND CABLE FAULT DETECTION USING IOT KIT

Shubham Murkute[*1], Ankit Patle[*2], Swapnil Kohale[*3], Suraj Poharkar[*4], Sakshi Chaudhari[*5], N.Y. Deshmukh[*6]

[*1,2,3,4,5]Department of Electrical Engineering, Smt. Radhikatai Pandav College Of Engineering And Technology, Nagpur, Maharastra, India.

[*6]Professor, Department Of Electrical Engineering, Smt. Radhikatai Pandav College Of Engineering & Technology, Nagpur, Maharastra, India.

ABSTRACT

The project's main goal is to discover and detect subterranean cable faults. Within the city. Instead of overhead lines, the electrical wires are routed underground. The procedure of fixing becomes tougher whenever a defect develops. The precise location of a defect in an underground electrical cable line is extremely difficult to pinpoint. The initiative will allow the technical personnel to respond more quickly to these problems. Short circuit faults, low voltage faults, and high voltage faults are the three types of defects that can occur. Only short circuit problems are identified using the approach previously suggested. This project can detect short circuit faults as well as low and high voltage issues. The ohms law is used in the system that has been designed. The suggested approach is utilized not only for identification but also for sending precise information about the defect to the authorities via IOT, as well as cutting the power supply to that specific place for the safety of the people.

I. INTRODUCTION

The Power distribution networks are constantly expanding, and their reliability is more critical than ever. The network's complexity includes several components that might fail and cause the end-power user's supply to be interrupted. Underground cables have been utilized for many decades for the majority of the world's running low and medium-voltage distribution lines. Underground high-voltage cables are becoming increasingly popular because they are unaffected by weather conditions such as strong rain, storms, snow, or pollution. Even though cable production technology is always improving, there are still factors that might cause the cable to fail during testing and operation. A properly placed cable can endure for up to 30 years if it is in good condition. However, faulty installation or badly executed jointing may readily damage wires, as can future third-party damage from civil works like trenching or curb edging.

Types of Faults in Cables : Open Circuit Fault, High voltage fault, Low voltage fault.

II. METHODOLOGY

During the previous few decades, many approaches for detecting cable line faults have been developed. Overhead lines are typically used. It can quickly detect flaws, however, we can't utilize overhead lines in urgent situations or in familiar cities. As a result, we've decided to go with buried cables. This article employs Internet of Things (IOT) technology, which enables authorities to remotely monitor and diagnose issues.

III. MODELING AND ANALYSIS

This study emphasizes the need of pinpointing the source of the problem. Through an arrangement resistor in the paper, a low DC voltage is delivered at the feeder end, and the current fluctuates based on the cable's insufficiency area. If there is any short out shortcoming with the Single Line to Ground issue, twofold line Ground issue, or three-stage to Ground issue, the activity of the framework expresses that when the current moves through the deficiency detecting circuit module, the current would differ depending on the length of the cable from the spot of flaw that happened. The voltage declines as the arrangement resistors change, and the signal is sent to the microcontroller's internal ADC to generate computerized data. The microcontroller will next process the advanced data, and the yield will be shown in kilometers and stages on the LCD connected to the microcontroller, depending on the issue conditions.

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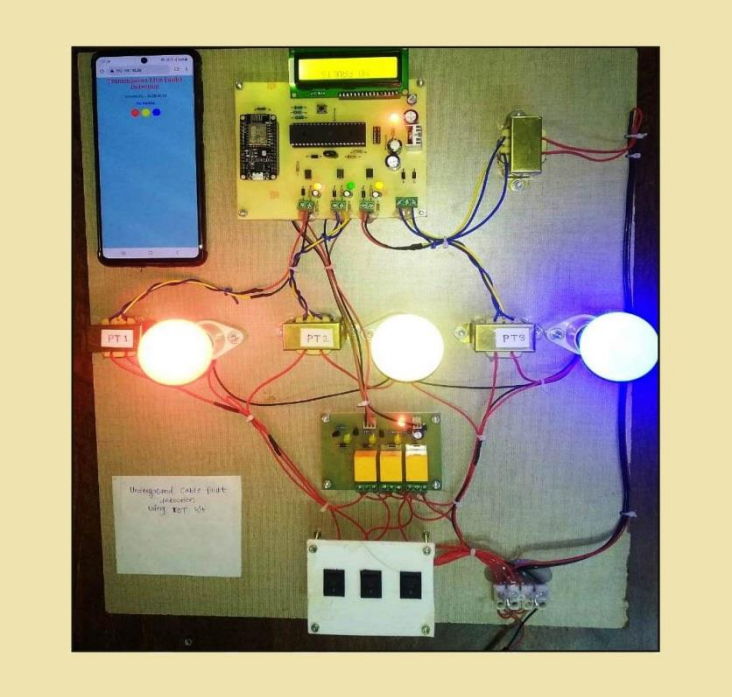

Figure 1: Model photo

IV. RESULTS

Though researchers devised methods for fault detection in un-ground fault detection systems, we were unable to determine when the fault occurred and its location, and in one of the existing methods to determine the location of the fault, a specific algorithm and some calculations must be performed, which can be time-consuming, and there may be a risk of major loss until then, but this is not the case here, thanks to Because real-time data may be downloaded from the server via mobile phones or laptops, authorities would be able to readily determine where you are. Not only that but the cable's life will be extended as a result of the system's implementation, since power transmission may be halted until the fault is fixed, avoiding wasteful losses caused by the current leakage. The suggested system identifies the fault's exact location. On a 16X2 LCD connected to the microprocessor, the fault occurrence distance, phase, and time are shown. Using the Wi-Fi module ESP8266, IOT is utilized to show data over the Internet. The following table lists the simulation and hardware results.

V. CONCLUSION

The real difficulty of identifying the fault in the subsurface region was simplified as a result of this study. We determine the location or position where the faults will occur, as well as the exact distance between the breaker point and the area where the faults will occur.

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