

ABSTRACT

The incident of the fire caused by a gas compression pipe leak at the oil refinery is an issue that can threaten the safety of people and the environment. Oil leaks in pipelines at oil refineries can lead to significant material losses, environmental pollution, and even the loss of human lives. One of the incidents was the explosion at the PT Pertamina Dumai oil refinery. In an effort to minimize the risk of fires caused by oil leaks, an effective temporary handling system is required. The designed control and temporary handling system for gas compression pipe leaks aims to detect oil leaks early and take appropriate temporary measures to prevent incidents. This device uses the MQ-135 gas sensor to detect oil leaks around the refinery pipes. The NodeMCU ESP32 microcontroller is used as the brain of this system, responsible for processing the data received from the MQ-135 sensor. The Blynk application serves as a platform for real-time and mobile monitoring, allowing operators to remotely monitor the condition of pipes and receive notifications if a leak is detected. As a temporary handling measure when a leak is detected, the system is equipped with a LED buzzer as a visual alarm to warn of any leakage. In addition, this system is also equipped with handling devices in the form of Foam nozzles that will automatically spray foam onto areas where leaks are detected. In the system design, a threshold value is set to determine the concentration of hazardous air, which is 100 ppm. This system design is capable of handling leaks when the reading exceeds the predetermined threshold value. With the integration of early detection, data processing, and responsive actions, this system can reduce the risk of fires at oil refineries and protect human safety and the environment. This innovation is expected to be an effective solution in managing safety and environmental concerns in the oil refinery industry.

Kata Kunci: *Blynk application, Oil leak, MQ-135*