

Design and Implementation of Smart Standalone Gas Fire Security System for Domestic Usage

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Liquid Petroleum Gas (LPG) fire security system for domestic gas cylinders has been designed and prototype is implemented. The proposed system automatically takes preventive measures in case of gas leakage. It includes an electronic circuit designed with 8-bit AVR microcontroller for emergency shut-off of the regulator for domestic gas cylinders, a control circuit for switching off the power nearby area and a transceiver unit for sending SMS to the corresponding people. In order for firing to occur LPG concentration should at least be reached to 200 ppm level. This level of LPG is detected with commercially available LPG sensor (MQ-5). A commercially available gas regulator is modified by attaching a spring and a solenoid valve. The spring is compressed when the regulator is ON in domestically available gas cylinders. Once a gas leakage of appropriate ppm is detected a pulse is sent to solenoid valve such that, the attached spring gets rest by removing off the regulator from the cylinder. At the same time warning messages will automatically be sent to relevant consumers via GSM module attached to the circuit. The circuit is operated with battery power so that it will work even in power failure. Additional gas sensors are installed in electrical switches located near to the gas cylinder to cut-off power to prevent any spark. Integrating all these sensors through IOT platform is the subject of an on-going study.

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