**ABSTRACT**

In the paper, "Gas Leakage Detection with Automatic Shut-Off Mechanism," a novel technology was introduced to counter the critical risks from LPG leaks, including fires and explosions, as well as damage to appliances. Early detection of such leaks is made possible by highly sensitive MQ-2 gas sensors monitoring LPG presence in the air and alerting the user through alarms and LED indicators at dangerous concentrations. The key feature is the automated shut-off mechanism, which activates an electromagnetic valve to cut off gas flow, thereby reducing hazards.

The key benefits of this system include enhanced safety, cost-effectiveness, and environmental protection by preventing accidents, reducing gas wastage, and lowering harmful emissions. The solution is applicable across various domains, including homes, industrial pipelines, and gas stations. With real-time monitoring and potential smartphone notifications, the technology significantly reduces human error and safeguards lives and property.The system design includes advanced sensors, Arduino microcontrollers, and a servo motor to provide an efficient, automated, and preventive safety mechanism.