



GUJARAT POWER RESEARCH & DEVELOPMENT CELL

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In the current power distribution systems of DISCOMs, certain areas experience significant challenges due to power theft, despite various preventive measures. A common method of theft involves direct hooking from conductors, cables, or other network components. To address this issue, the GPRD Cell has developed an innovative Smart Distribution System that upgrades the sub-distribution voltage from 0.433 kV to 1.1 kV.

This system includes a theft-proof metal enclosure housing a 3/5 kVA single-phase transformer with a 1.1/0.24 kV ratio, energy meters, relays, and IIoT-enabled devices for remote monitoring and control. By preventing direct access to the LT line and energy meters, the system significantly reduces energy theft and enhances overall network monitoring and control. This solution provides a sustainable and effective method for mitigating power theft, improving system efficiency, and ensuring more reliable power distribution.



System and Method for Reduction of Distribution Power Losses by Smart Distribution “SD_1.1 kV”

Features

- Reduction in power theft through theft-proof enclosures, preventing direct hooking and meter tampering
- Decreased technical losses due to upgraded voltage from 0.433 kV to 1.1 kV
- Web-based dashboard for real-time monitoring of individual consumers
- Protection against of overloading caused by consumer equipment
- Group metering and accurate energy accounting within smart distribution box
- Automated Meter Reading (AMR) for improved billing accuracy and efficiency
- Enhanced grid stability, security, and consumer accountability

Benefits

- Cost-effective and technologically viable solution for power utilities
- Effective in reducing power theft in high-loss areas with social engineering support
- Improves financial health of DISCOMs by cutting losses and boosting revenue
- Reduces transformer failures, service wire and meter burnouts
- Lowers technical losses and extends asset lifespan through proactive monitoring

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The SD_1.1 kV is a novel concept and it performing best and satisfactorily in the field