

The high-voltage distribution box experiences power outages during rain



Overview

Water from heavy rainfall and flash flooding compromises ground-level equipment, especially at substations where high-voltage electricity is converted for distribution. However, many recent weather-induced disasters have brought unprecedented challenges to the electricity networks, underlining that power systems remain unprepared to absorb disruptive large-scale and severe events. Worse still, it is expected that such climate hazards will take place at rising. The experience of a power outage during a rainstorm is a common annoyance that highlights the vulnerabilities of the electrical grid to natural forces. Power failures during rainfall are not simply caused by water alone, but by a combination of mechanical damage, electrical failures exacerbated by. Rain can certainly cause power outages, though the mechanism is often more complex than simply water hitting a wire. The electrical grid is designed to withstand typical weather, but water introduces multiple failure points that compromise the system's integrity, often indirectly. After all, the towers are made of steel, which conducts electricity, and the wires themselves carry high voltage. So, what prevents electricity from jumping from the wires to the. To address these, this paper proposes an optimal control strategy for distribution network power transfer, integrating Long Short-Term Memory (LSTM) networks and dynamic optimization models. By fusing meteorological data with grid characteristics, the LSTM model predicts load demand and fault.



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