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Resilience in Power Systems

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The electrical power system is a critical infrastructure that affects a nation's economy, security, and health. Failure of the power system can severely affect other critical infrastructures such as water, gas, and transportation. With the rise in the frequency of extreme events caused by climate change and cybercrimes, the power system's complexity and interconnections have changed the risk landscape. Therefore, a new design philosophy, analysis methodologies, and tools are needed. The concept of "resilience" has been used to find new solutions to shorten the duration and reduce the severity of power blackouts caused by extreme events. Enhancing the resilience of power systems under extreme conditions is an essential issue in power system operation and control system design. Microgrids and renewable energy resources, including renewable energy sources, are promising methods to enhance power system resilience. The research objective is to develop a Comprehensive Resilience Enhancement Program in power systems.