



Microgrid System Security

How does a microgrid affect cyber security?

Microgrid systems are connected to external networks, such as enterprise networks and the Internet, which significantly increases the cyber-threats to them. Cyberattackers can attack microgrid power enclaves and compromise critical operations by exploiting vulnerabilities at the network, system, and/or application level.

What is a microgrid vulnerability?

Because the microgrid consists of such essential systems as computers, actuators, sensors, and emergency systems, it faces difficulty in guaranteeing uninterrupted communication, interfacing, and security between heterogeneous and independent systems. All these vulnerabilities are considered weaknesses that can be exploited by one or more threats.

What is a microgrid electrical system?

The infrastructure and processes involved in a microgrid electrical system require advanced technology to facilitate connection among its various components in order to provide the intelligence and automation that can benefit users. As a consequence, the microgrid has vulnerabilities that can expose it to a wide range of attacks.

How secure is a microgrid?

A considerable number of studies have affirmed that the operation and data processing, transmission, and storage of microgrids must be secure to achieve reliable control [10, 11]. The fundamental elements and components of a microgrid are discussed below. The reference architecture of microgrid used in this research is given in .

The cybersecurity concerns of intelligent microgrids are thoroughly investigated in this scholarly work. The intricate link that exists between the cyber grid and smart grid operating ...

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This study explores the determinants of microgrid technology adoption, emphasizing enhanced security through the Unified Theory of Acceptance and Use of Technology (UTAUT) ...

Bushra et al. [16] reviewed cyber-physical security challenges from the resilient microgrid systems' perspectives. Some literature also provided analysis on mitigation approaches of ...

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This paper introduces a quantum key distribution (QKD)-based microgrid testbed, in which the security of information flow is ensured by encryption keys generated by the QKD system.

The proposed cyber threat and anomaly detection system employs an integrated approach combining machine learning (ML) techniques, real-time monitoring, and pattern recognition ...

This cyber system plays a crucial role in ensuring the security, efficiency, and reliability of MGs digital operations. The system collects, shifts, processes, displays, as well as stores information ...

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The emergence of Smart Microgrids (SMGs) within modern Cyber-Physical Systems (CPS) marks a transformative shift in energy distribution efficiency and renewable resource ...

Due to their complexity and inter-connectivity, MGs are increasingly vulnerable to a range of cyber-attacks that can compromise system stability, reliability, and safety. This paper presents an ...

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