

Can microgrids improve resilience of power systems?

In recent years, much research has been conducted on utilizing microgrids (MGs) to enhance the resilience of power systems, especially for distribution systems. MGs are regarded as localized small power systems, which have two operational modes: grid-connected mode and islanded mode .

Are networked microgrids a resilience solution?

Networked microgrids have been shown to help with the post-disaster recovery of the utility grid in weak regions of the power system due to their strategic installation. While microgrids are increasingly being adopted as a resilience and reliability solution for the power system, their own vulnerabilities cannot be ignored.

What is a microgrid resilience assessment?

A microgrid's resilience assessment begins with listing all relevant threats to a system, inclusive of severe weather events (i.e. thunderstorms), natural disasters (i.e. earthquakes), and human factors (i.e. terrorism). Threat likelihoods are parameterized as described above and assigned a level of importance.

Is a microgrid resilient against cyber threats?

Microgrids can provide a backup source of power during grid outages and ensure the resilience of critical loads. However, this requires that the microgrid itself is resilient to both physical and cyber threats.

Do critical infrastructure systems affect resilience modeling of a microgrid?

Critical Infrastructure (CI) systems pose threats to microgrid operation due to their highly interdependent nature. The impact of interdependencies between CI systems on resilience modeling of the microgrid is discussed. Due to interruptions in natural gas and/or water supply, there are threats to the microgrid.

Are DoD installations pursuing microgrids to meet energy resiliency goals?

Department of Defense Instruction 4170.111 requires installations to be more energy resilient, and as a result, many installations are pursuing microgrids to meet their energy resiliency goals and requirements. This report provides a resource for stakeholders involved in analyzing and developing microgrid projects at DoD installations.

This paper, thus, proposes a customized site-specific quantification of the resilience strength for the individual microgrid's capability to absorb, restore, and adapt to the changing circumstances for sustaining the critical load when a low-probability high-impact event occurs--termed as--context-aware resilience metric.

This paper proposes a method for analyzing the resilience metric of new energy grid-connected microgrid system, and proposes optimization strategies to improve resilience. Firstly, a measurement method for the resilience of the microgrid system is established based on the operating characteristics of the system components.

This report provides a resource for stakeholders involved in analyzing and developing microgrid projects at DoD installations. It builds on experience and lessons from the U.S. Department of Energy's (DOE) National Renewable Energy Laboratory (NREL) in supporting numerous DoD projects, including the microgrid at Marine Corps Air Station ...

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Energy Pool and Enercal are pioneering advanced microgrid solutions to support New Caledonia's transition from diesel generators to zero-carbon energy sources like PV and biofuels. A smart energy management system (EMS) to maximize ...

loads, simulate electrified platform use, model new loads using a digital twin, and evaluate the addition of renewables and energy storage to augment grid supply power. The results inform ...

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