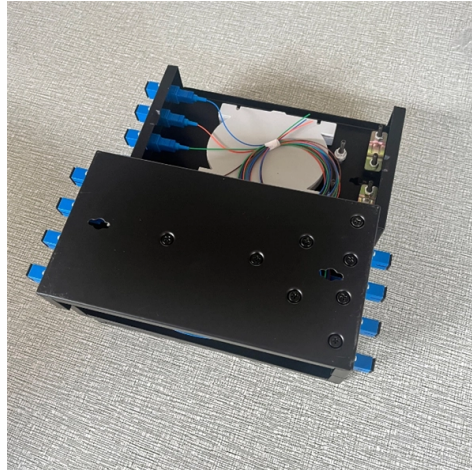


Pilot Project for Distribution Network Automation



Overview

For over a decade, electric companies have expanded implementation of distribution automation (DA) on the grid.

Key Takeaways

Pilot projects in distribution network automation aim to digitally enhance grid reliability, optimize load management, and integrate new energy demands such as electric vehicle charging.

Overview of Distribution Network Automation (DNA)

Distribution Network Automation (DNA) involves real-time monitoring, control, and optimization of electric distribution systems from remote locations. It enables utilities to automatically detect, isolate, and restore faults, optimize voltage and reactive power (volt/VAR control), and improve overall system reliability and efficiency. DNA systems often integrate intelligent electronic devices (IEDs), automated switches, sensors, and controllers, which communicate via secure networks to central management systems for coordinated operation and decision-making .

Objectives of Pilot Projects

Pilot projects for DNA typically aim to:

- Prevent overloads in low- and medium-voltage networks without costly physical upgrades .



- Enable integration of distributed energy resources, including home EV charging stations, while maintaining voltage stability .
 - Test advanced automation functionalities, such as fault location, isolation, and service restoration (FLISR), and volt/VAR optimization .
 - Evaluate communication protocols and interoperability between legacy and new equipment .
 - Assess cost-effectiveness and operational benefits before large-scale deployment .
- Example: Siemens and Stromnetz Hamburg Pilot

Siemens and Stromnetz Hamburg launched a three-year pilot project to digitalize secondary distribution networks in Hamburg. The project focuses on:

- Avoiding extensive network expansion by using digital solutions to manage load peaks, particularly from EV charging .
- Applying resilient ICT systems to monitor and control low-voltage networks in real time .
- Maintaining specified voltage ranges while integrating home charging stations, which previously operated without external control .
- Reducing labor-intensive upgrades, such as replacing transformers or cables, which can disrupt urban living .

Example: Westar Energy SmartStar Project

In the U.S., Westar Energy implemented a distribution automation system under a DOE co-funded Smart Grid Investment Grant. Key features include:

- Centralized distribution automation controller (DAC) for feeder voltage optimization.
- FLISR functionality to automatically locate, isolate, and restore service during faults.
- Protocol translation and integration with legacy systems and energy management systems.
- Remote monitoring and control via cellular modems and secure Ethernet gateways, improving operational efficiency and reducing outage durations .

Benefits of Pilot Projects

- Enhanced reliability and resilience: Automated fault detection and restoration reduce outage frequency and duration .
- Optimized voltage and reactive power: Improves power quality for sensitive loads .
- Cost savings: Reduces the need for physical network upgrades and labor-intensive interventions .
- Support for electrification: Facilitates integration of EVs and renewable energy sources without overloading the network .

- Data-driven decision-making: Remote monitoring and analytics enable predictive maintenance and better asset management .

Conclusion

Pilot projects for distribution network automation serve as testbeds for digitalizing and modernizing power distribution systems. They allow utilities to evaluate advanced automation technologies, improve grid reliability, manage increasing loads from EVs and distributed energy resources, and optimize operational costs before full-scale deployment. Real-world examples like Siemens and Stromnetz Hamburg in Germany and Westar Energy in the U.S. demonstrate the practical benefits and challenges of implementing DNA solutions .

Article Content

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Distribution Automation

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Distribution Grid Modernization

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The project involves complete integration and automation of distribution and transmission within the substation. The critical design

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Smoothing the Rocky Road to Distribution Automation

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An overview on distribution automation system

The concept of distribution automation system is put forward to improve power supply reliability and power quality to users. To begin

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Assessing the contribution of automation to the electric distribution ...

As this automation process lies in the use of non-ideal communication channels, their latency and availability are

Distribution Automation | Grid Modernization | Electrical Transmission ...

Distribution automation (DA) digitizes electrical distribution services and data, enabling utilities to see deep inside the grid —

Distribution Automation, Then and Now

Historically, utility industry practitioners have associated distribution automation (DA) with the real-time data acquisition

Today and Tomorrow: The Distribution Automation Ecosystem

INTRODUCTION Distribution automation (DA) can achieve substantial impacts—such as improving distribution system resilience

(PDF) Analysis of distribution network reliability based on ...

This study investigates the influence of distribution automation on the dependability of electricity networks,

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The Why and How of Distribution Automation DA involves the integration of intelligent devices, communication networks and

Distribution Automation System Implemented for Underground

The idea is to combine network data, topology and distribution automation data and develop new fault management

Distribution networks reliability assessment considering distributed ...

Where, they focused on the important role of the communication system capabilities to enhance the performance of the

(PDF) Distribution Automation Systems (DAS) -Overview

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Research on intelligent distribution network automation design

Finally, take a specific urban distribution network project as an example and its revamping scheme is introduced. The

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Chattanooga Electric Power Board Case Study—Distribution

The distribution automation technology allows fault locations to be more precisely located on feeder subsections. Combining this

Navigating warehouse automation strategy for the distributor market

A notable example of successful automation is a regional grocery chain. Faced with outdated warehouse operations,

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This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

