

# Distribution network automation helps combat typhoons



## Overview

To address the decline in power supply capability of distribution networks during typhoons, it is necessary to fully utilize distributed resources in distribution networks and enhance the resilience of distribution networks during disasters from multiple aspects such as. To address the decline in power supply capability of distribution networks during typhoons, it is necessary to fully utilize distributed resources in distribution networks and enhance the resilience of distribution networks during disasters from multiple aspects such as. To improve the accuracy of typhoon-induced hazard intensity forecasting, an LSTM network enhanced with multi-scale attention (LSTM-MSA) is developed, which overcomes the deficiency of the traditional LSTM model that cannot capture the local attention mechanism. Building on this, a. Under the impact of typhoon disasters, the judicious utilization of tie lines and emergency resources can enhance the resilience of distribution systems. Leveraging Deep Reinforcement Learning (DRL) technology, a two-stage resilience enhancement (TSRE) method for distribution systems is proposed to. To enhance the resilience of cyber-physical distribution systems against typhoons, this paper proposes a resilience-oriented robust optimization model, in which planning-operational restoration measures are incorporated into a prevention and emergency response framework.

## Article Content

Nov 03, 2025

Figure 1 from Resilient Transmission Network Hardening

Fig. 1. The schematic diagram of IEEE-14 transmission system integrated with distribution system at bus 11 - "Resilient Transmission Network Hardening

Dec 12, 2025

Stochastic pre-disaster planning and post-disaster restoration to ...

Abstract In recent years, extreme weather events, such as typhoons, have led to large-scale power outages in distribution systems. As a result, developing strategies to bolster

Aug 29, 2025

A robust resilient-oriented design for the cyber-physical distribution ...

To enhance the resilience of cyber-physical distribution systems against typhoons, this paper proposes a resilience-oriented robust optimization model, in which planning-operational...

Apr 24, 2026

Risk analysis of distribution network outages under a

4.3 Distribution network outage risk analysis Based on the influencing factors shown in Figure 6, we analysed and quantified the distribution network

Aug 08, 2025

A robust resilient-oriented design for the cyber-physical distribution ...

The cyber-physical deep coupling makes distribution systems face severe operation risks under small-probability and high-impact disasters. To enhance the resilience of cyber-physical distribution

Sep 17, 2025

Stochastic pre-disaster planning and post-disaster restoration to ...

Abstract In recent years, extreme weather events, such as typhoons, have led to large-scale power outages in distribution systems. As a result, developing strategies to bolster distribution system

Apr 06, 2026

Review of distribution network's resilience based on typhoon disaster

This paper mainly studies the influence of typhoon disaster on distribution network, and summarizes the research results of existing resilient distribution network in typhoon model, pre

Apr 07, 2026

The Role of Automation in Modern Distribution Networks

Conclusion Automation is no longer a luxury; it's a necessity for businesses looking to stay competitive in the fast-paced world of modern

May 23, 2026

Multi-dimensional Resilience Enhancement Strategy for Distribution ...

Based on the typhoon asymmetric wind field disaster model, a dual-layer architecture of distribution networks is proposed based on the improved normal constraint method to support multi-dimensional

Jan 29, 2026

Research on Optimal Control Strategies on Distribution

Among these extreme events, typhoons represent one of the most destructive hazards for distribution networks, with particularly significant impacts

Jan 06, 2026

Distribution Automation

Our testing solutions ensure distribution automation systems function as intended and integrate seamlessly with existing grid infrastructure.

Nov 30, 2025

Differentiated Reinforcement Method for Distribution Networks Based

In view of the shortcomings of existing researches, this paper proposes a differentiated reinforcement method for distribution networks in the pre-disaster stage based on an improved PPO algorithm. By

Jul 29, 2025

DQN-Based Two-Stage Resilience Enhancement Method for

Against this background, this paper proposes a deep reinforcement learning (DRL) method for the second-stage resilience improvement of distribution systems under typhoon disasters.

May 25, 2026

Enhancing resilience of power-transportation coupled networks to ...

Most studies focus on distribution networks (DNs) without considering the important coupling relationship between transportation networks (TNs) and DN. This paper addresses this

Oct 10, 2025

(PDF) Resilience Enhancement for Distribution

To enhance the resilience of DN against such events, a typhoon-oriented resilience framework for DN is proposed that incorporates multiple

Jul 18, 2025

Review of big-data and AI application in typhoon-related disaster risk ...

Macao, like many coastal cities, is prone to typhoons, and the city has been using big data and AI to improve its disaster risk reduction (DRR) efforts. One example of the use of big data and AI

Aug 26, 2025

Strategies to Improve the Resilience of Power Distribution Networks ...

In recent years, the increasing frequency of typhoons and urban flooding incidents has significantly jeopardized the power supply security of distribution netwo

Mar 20, 2026

DQN-Based Two-Stage Resilience Enhancement Method for Distribution ...

However, these studies are limited to the pre-disaster and post-disaster phases and do not consider the distribution network response during the disaster phase. Against this background,

Aug 04, 2025

Enhancing pre-disaster resilience of distribution networks considering ...

To address this limitation, this study proposes a pre-disaster resilience enhancement scheme for DCPS that integrates the temporal characteristics of typhoon evolution and cyber

Jun 21, 2026

A comprehensive strategy for the distribution network resilience ...

Semantic Scholar extracted view of "A comprehensive strategy for the distribution network resilience enhancement considering the time-varying behaviors of typhoon path" by Zhanghao Huang et al.

Jun 27, 2025

Improving the resilience of the distribution system using

Some other studies [15 - 27] have considered the effect of automation of distribution system switches in solving the problem of assessing the resilience

Jun 03, 2026

Resilience enhancement of distribution network under typhoon

Therefore, the utilities aim to develop optimization models that can enhance the resilience of distribution networks against typhoon disaster. In recent years, the concept of

May 20, 2026

Method for enhancing distribution network resilience under typhoon ...

To improve the accuracy of typhoon-induced hazard intensity forecasting, an LSTM network enhanced with multi-scale attention (LSTM-MSA) is developed, which overcomes the deficiency of the

Oct 03, 2025

A tri-level Typhoon-DAD robust optimization framework to enhance ...

In the end, the proposed framework is tested through a case study using real data from super typhoon "Mangkut" (2018) in Yangjiang, China. The result shows that it can effectively reduce

May 19, 2026

Optimal planning of a soft open point in a distribution network subject ...

While Soft Open Point (SOP) shows its strong capability to control load transfer and regulate network voltage profile in a distribution network, there are limited considerations of the high

Aug 17, 2025

Severe Weather and Distribution Grid Automation

Severe weather challenges the electrical distribution grid resiliency; however, the commitment by utilities to further modernize the grid can reap the benefits of

Mar 14, 2026

Resilience enhancement strategy for distribution networks considering ...

Against the dual background of frequent occurrence of typhoon disaster and increasing penetration of new energy generation, a rolling optimal scheduling strategy of multiple flexibility resources including

Dec 30, 2025

Resilience Enhancement of Coordinated Transmission and

Abstract: The occurrence of high-impact low-probability (HILP) natural disasters such as typhoons poses a significant threat to the secure operation of transmission and distribution (T& D) network system.

## Contact Us

For more information, pricing, or custom solutions, please contact us:

Website: <https://piano-lessons.co.za>

Email: [info@piano-lessons.co.za](mailto:info@piano-lessons.co.za)

Phone: +31 6 37258914

Address: Herengracht 123, 1015 BT Amsterdam, Netherlands

This document is for informational purposes only. Specifications subject to change without notice.

