Relay Protection in the 14th Five-Year Plan



Overview

The planning and construction is based on a large-scale wind and photovoltaic base, and its surroundings are clean, efficient, advanced and energy-saving.

Key Takeaways

Relay protection systems are a key component of China's 14th Five-Year Plan, ensuring grid reliability, supporting low-carbon energy integration, and modernizing the power system.

Role of Relay Protection

Relay protection systems are critical for maintaining the reliability and stability of the Bulk Electric System (BES). They detect abnormal conditions such as overcurrent, underfrequency, undervoltage, or sudden pressure changes, and automatically isolate affected components to prevent cascading failures. During the 14th Five-Year Plan (2021–2025), China emphasizes strengthening energy network security management, risk management, and emergency response capabilities, which directly involves upgrading and maintaining relay protection systems across the grid.



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Integration with Modern Energy SystemsThe 14th Five-Year Plan promotes a low-carbon, high-quality energy transition, including increased non-fossil energy generation, flexible power supply, and smart grid technologies. Relay protection systems are being adapted to handle: Distributed generation aggregation: Protection systems now cover dispersed renewable energy sources exceeding 75 MVA at 100 kV or above, ensuring safe integration into the grid. Automatic reclosing and remedial action schemes (RAS): These systems improve fault recovery and maintain grid stability near generating plants and critical substations.

Flexible and low-carbon energy integration: Relay protection supports variable renewable energy sources, such as wind and solar, by providing fast fault detection and isolation to prevent voltage collapse or instability.

Maintenance and Reliability Programs

Under PRC-005-6 standards, each transmission and generation owner must implement a Protection System Maintenance Program (PSMP). Key elements include: Time-based and performance-based maintenance for relays, automatic reclosing devices, and sudden pressure relays. Monitoring of critical components, including station DC supply batteries, to extend maintenance intervals while ensuring reliability.

Documentation and corrective action tracking to prevent misoperations and ensure compliance with operational standards. Strategic Objectives in the 14th Five-Year PlanRelay protection aligns with broader national goals: Enhancing grid security: Ensuring reliable electricity supply to key cities, core areas, and important users. Supporting low-carbon transformation: Facilitating integration of renewable energy while maintaining system stability.

Improving emergency response: Strengthening risk management and rapid fault isolation to minimize outages. Modernizing the power system: Incorporating smart grid technologies and advanced protection schemes to handle complex energy flows.

Conclusion

During the 14th Five-Year Plan, relay protection systems are central to China's energy modernization strategy, combining technical reliability, renewable energy integration, and emergency preparedness. By implementing robust maintenance programs and upgrading protection schemes, China aims to achieve a secure, flexible, and low-carbon power system that supports national energy security and sustainable development goals.

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Article Content

THE 14TH FIVE-YEAR PLAN AND LONG-RANGE OBJECTIVES

security risks, and redouble capacity building in this regard. We will maintain security in key areas such as important industries, infrastructure, strategic resources, and major science and technology

14th Five-Year Modern Energy System Planning "14th

The planning and construction is based on a large-scale wind and photovoltaic base, and its surroundings are clean, efficient, advanced and energy-saving.

THE 14TH FIVE-YEAR PLAN AND LONG-RANGE OBJECTIVES

Part in Reform and Development of the Global Governance System Pursuing peace, development, cooperation, and mutual benefit and following an independent foreign policy of peace, we will

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It is a grand blueprint for China''s embarkation on the new journey of building a modernized socialist country in an all-round way, and a common program of action for all ethnic groups in the country.

14th Five-Year Plan: Modern Energy System Planning (2021-2025)

It seeks to coordinate measures to improve national energy security and achieve carbon peaking by 2030 and carbon neutrality by 2060 to ensure a high-quality economic and social development. It

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During the 14th Five-Year Plan period (2021-2025), China has enhanced its legislation work with the aims of better serving the high-quality social and economic development, and better

Major targets in 14th Five-Year Plan

We will keep major economic indicators within an appropriate range, set annual targets for economic growth in light of actual conditions, ensure that overall labor productivity grows faster than GDP, keep

CSET Original Translation: China''s 14th Five-Year Plan

Read our original translation of China''s 14th Five-Year Plan, which was passed by the National People''s Congress in March, 2021, and covers the years 2021-2025.

14th Five Year Plan: Energy Conservation Emissions Reduction Work

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The plan notably aims to implement key projects of energy conservation and emission reduction within key industries such as iron and steel, non-ferrous metals, building materials, petrochemicals and

China''s 14th Five-Year Plan: A nation transformed

As China''s 14th Five-Year Plan (2021-2025) nears its conclusion, the country is taking stock of a time defined by resilience, innovation, and transformation, with ministries outlining

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With the 14th Five-Year Plan period (2021-2025) nearing conclusion, China has clocked up a series of landmark achievements, including a resilient economy, solid steps in green transition and

Improving Environmental Quality

Improving Environmental Quality To intensify the battle against pollution, we will establish a sound environmental governance system to promote pollution control in a targeted, scientific, law-based,

Issue Brief

The 14th five-year plan (FYP), covering the years 2021 to 2025, was officially endorsed by the National People''s Congress (NPC) on 11 March 2021. The Plan is divided into 19 sections and 65

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The 14th Five-Year Plan differs from past plans in that it also includes a short section on "long-range objectives" for 2035. Note that although this document is an "outline," the PRC government has

How China''s 14th Five-Year Plan guides its economic growth

As the 14th Five-Year Plan period (2021-2025) draws to a close, China has achieved a series of historic milestones, from economic resilience and green transition to technological

National Emergency Management System Plan during the 14th Five-Year ...

1. Achievements in the 13th Five-Year Plan Period During the 13th Five-Year Plan period, following the guidance of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, all local

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ironmental protection constitute formidable and long-term challenges, and weak links remain in the safeguards for people''s wellbeing and social governance. In implementing the national rejuvenation

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

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