



## Ensuring digital security in power infrastructure is vital for ecological safety

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All ABB substations and offerings are rigorously tested for seismic zones 4 or 5, depending on the severity of the locations they serve.

In the dynamic power distribution landscape, ageing infrastructure poses challenges. In a talk with EPR Magazine, Bipin Kumar explores these challenges, government initiatives, ABB's cybersecurity measures, resilience to natural disasters, automation contributions, and the company's role in India's renewable energy goals.

#### What are the prominent challenges faced due to ageing substation infrastructure, and how are the government initiatives addressing these challenges?

Significant challenges exist in the power distribution sector, with one prominent issue being the ageing infrastructure. Many substations still utilise technologies from previous decades, needing more communication capabilities and relying on older systems. Upgrading these substations to incorporate advanced numerical relays and automation systems is essential, but it poses challenges. Transforming them into communicable entities involves integrating intelligent electronic devices like relays and digital systems.

This process aims to establish a digital platform where all data can be centrally monitored, enabling swift decision-making by substation managers.



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While hardware replacement is relatively straightforward, the primary challenge is digital transformation, ensuring data accessibility and faster decision-making. The complexities of this endeavour are emphasised, requiring a meticulous government approach.

Government initiatives, such as the India Upadhyaya and IPDA schemes, have made strides in strengthening the distribution system. A notable addition is the Revamped Distribution Sector Strengthening (RDS) scheme, which demonstrates a continued focus on enhancing distribution infrastructure. This scheme prioritises the underground cabling network, emphasising the extension of power accessibility to even the most remote areas. The RDS scheme is a significant initiative by the Ministry of Power, with various utilities actively implementing it to fortify the power cabling system and improve overall power reachability nationwide.

#### How does ABB prioritise and address cybersecurity in its digital power infrastructure, ultimately benefiting the country's power sector?

Ensuring the security of digital systems in power infrastructure is a crucial ecological consideration. As systems become digitalised, ABB significantly focuses on cybersecurity standards to safeguard against potential threats. Intelligent electronic devices, particularly relays, are vital components in communication systems. ABB ensures that all relays

comply with international standards such as NERC CIP and IEC 62443 for cybersecurity, protecting against unauthorised modification or destruction of information systems, whether accidental or intentional.

In the realm of cybersecurity, ABB remains vigilant and proactive. With the prevalence of numerical relays, adherence to standards like NERC CIP and IEC 62443 becomes paramount. These standards are widely accepted as benchmarks for ensuring the resilience of systems against cyber threats.

The government has issued cybersecurity notifications in the last two years, acknowledging the evolving landscape. While these notifications intend to enforce cybersecurity testing for equipment integrated into digital power systems, the implementation specifics initially needed to be improved. ABB, however, has consistently exercised caution, actively participating in the standardisation and definition of various cybersecurity standards. Notable among these are ISO 27001, IEC 62443, IEEE P1686, and others, collectively addressing and mitigating cybersecurity risks in the digitalisation of power infrastructure.

#### How can power substations be designed and equipped to withstand natural disasters and emergencies, ensuring uninterrupted power supply in such situations?

ABB ensures the resilience of its



installations and solutions to natural disasters, particularly seismic events. All ABB substations and offerings are rigorously tested for seismic zones 4 or 5, depending on the severity of the locations they serve. This testing provides a certain degree of protection during events like earthquakes. While technological upgrades, such as the increasing acceptance of gas-insulated switchgear, enhance flexibility and efficiency, adherence to seismic standards remains a constant. ABB exemplifies its commitment in real-world scenarios, like a Gujarat substation facing heavy floods, where ABB's rapid service response demonstrated efficiency in corrective measures and the swift installation of new substations.

**What role does ABB play in the ongoing discussions about automating the power grid, and how does their contribution impact the evolution of power infrastructure in India?**

The initial discussions revolved around more than just automating the power grid. Automating the grid not only facilitates technology upgrades but significantly accelerates decision-making within the ecosystem. The ultimate goal is to ensure the uninterrupted functioning of power equipment throughout its service life. ABB's substantial contribution lies in monitoring and diagnostics,

where specific sub-equipment pieces provide 24/7 access to performance parameters, trends, and analytics. This proactive approach offers insights into potential future issues, allowing a shift from scheduled to condition-based maintenance.

Recent automation systems, a crucial part of the equation, enable both diagnostics and swift control. ABB's innovative stride includes a centralised protection system, consolidating protection intelligence into a single device for the entire substation. This not only digitises the system but also streamlines it by reducing the necessary components. This centralised protection system is poised to be a transformative force in the evolving landscape, particularly as India progresses toward a more digitalised power grid. As the degree of system complexity increases, the company's advancements promise to play a pivotal role in shaping the future of power infrastructure in India.

**How is India working towards achieving its renewable energy goals, and how does ABB contribute to the sector's growth in the country?**

India has made significant strides in its power distribution scenario, with a notable focus on renewable energy sources, particularly solar and wind.

While conventional generation has slowed, green energy has gained momentum. However, maintaining a consistent and sustainable energy supply throughout the day, including at night, requires strategic planning.

Key elements for achieving this include effectively integrating renewable sources into the grid, balancing them with conventional generation, and employing battery energy storage systems. These storage systems play a crucial role in storing excess energy generated during peak times for use during periods of lower generation, ensuring a constant power supply. Additionally, the development of interstate transmission lines facilitates power transportation from one region to another, addressing specific energy needs.

In India, the focus is on achieving a target of 450 gigawatts of renewable energy by 2030. ABB has contributed to the renewable sector's growth by providing tailored solutions. Specifically, ABB offers a comprehensive battery energy storage system and essential components, enhancing overall efficiency. ABB's commitment to sustainable energy solutions aligns with the evolving energy landscape in India, contributing significantly to the nation's renewable energy goals. ⚡