



# Learn how GE Digital is delivering the world's largest Wide Area Monitoring System (WAMS) to Power Grid Corporation of India (PGCIL) to secure India's Northern grid and improve energy access

The Power Grid Corporation of India (PGCIL) is a central transmission electric utilities company, and is amongst the largest power transmission utilities in the world. Transmitting around 50% of the total power generated in India on its transmission network, PGCIL is playing a vital role in the growth of the Indian power sector by developing a robust integrated national grid, and associating in the Government of India's program to provide power for all.

[ge.com/digital/wams](https://ge.com/digital/wams)





# THE CHALLENGE:

Today, the Indian electricity network is the world's largest synchronized grid with a capacity of 363 GW. In July 2012, India suffered the world's biggest power blackout due to a grid failure which impacted more than 620 million people across 22 states.<sup>1</sup>

A committee of international experts was formed by the government to minimize the future possibility and impact of grid failure. They recommended the implementation of a Wide Area Monitoring system (WAMS) solution across the country to measure the dynamic state of the grid and detect the onset of any unstable oscillation event.



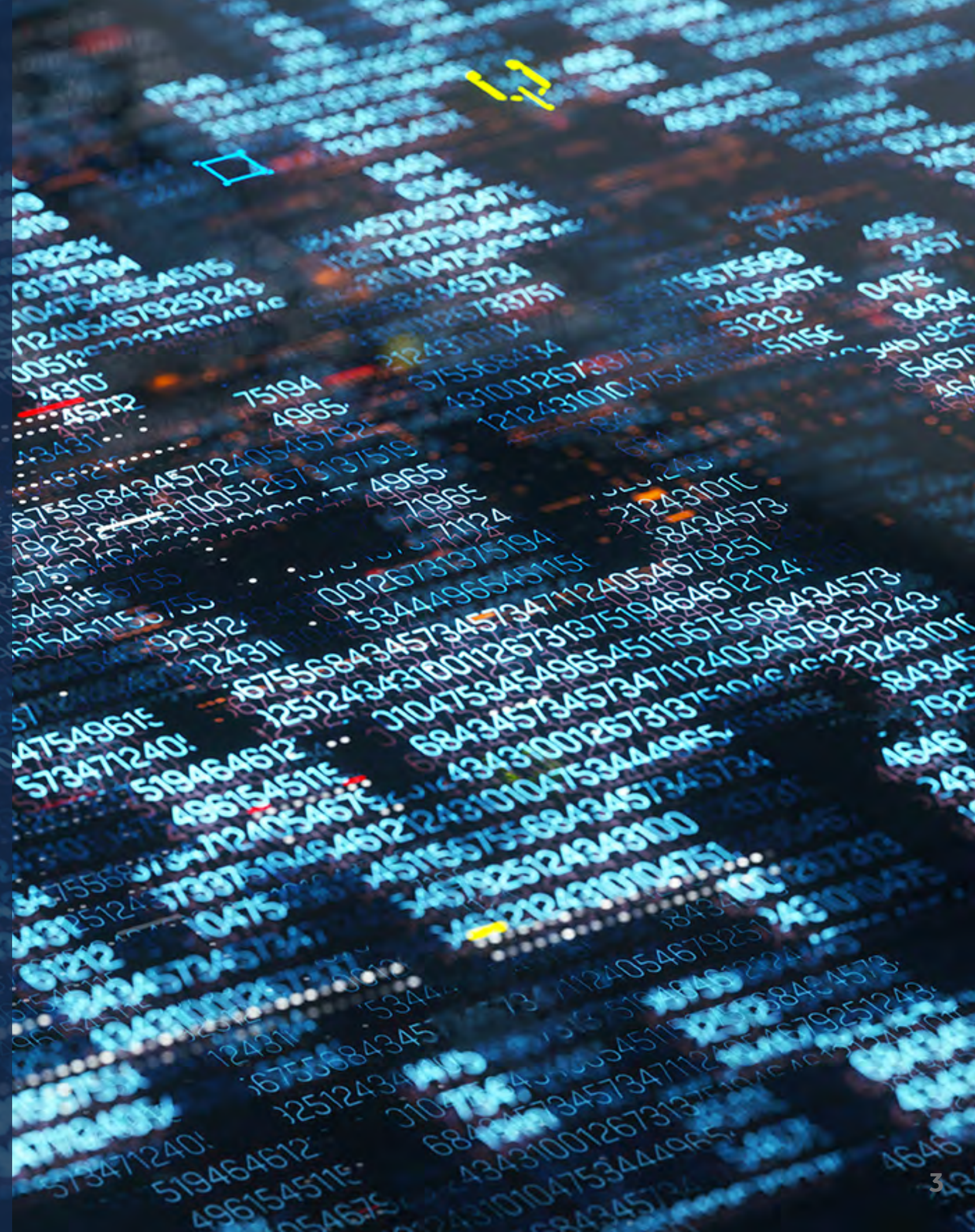


# THE GE DIGITAL SOLUTION:

When fully commissioned, this new WAMS solution will be the world's largest comprised of 1,184 Phasor Measurement Units (PMUs) and 34 control centers across India, 350 substations in the national grid. This solution obtains input data 25 times per second from all the PMUs installed (as compared to conventional SCADA, sampling once in nearly 5 seconds), with real time views on geographic displays, analytical applications and the capacity to store 500 TB of data.

Moreover, it will also fully secure the grid from any cyber security threat, incorporating the latest firewall policies. GE Digital also equips the control centers with PhasorPoint, a software solution to enable PGCIL to identify and analyze system vulnerabilities in real-time.

The development and testing of the new software and substation devices was undertaken by GE Digital teams from India, the UK and USA supported by PGCIL teams for a duration of two years.





# RESULTS

GE Digital's WAMS offers a vast improvement over existing grid monitoring systems such as Energy Management Systems (EMS) and Supervisory Control and Data Acquisition systems (SCADA) which can only provide a steady state view of the power system and with a significantly higher delay. In contrast, WAMS is an advanced measurement system which uses phasor measurement units (PMUs) to measure the dynamic state of the grid and detect the onset of any fluctuation across the grid.

Through visualization displays, it supports the speedy detection of any fluctuation across the grid and provides real time data for advanced analytical applications resulting in better grid management.

The commissioning of Wide Area Monitoring System (WAMS) technology of this scale and size is unparalleled in the history of power transmission in India. This will prove to be an important milestone in ensuring supply of uninterrupted, 24X7 high-quality power supply and integration of renewable energy with the country's electrical grid. PGCIL will harness the benefits of real-time data monitoring, improved decision making, and stronger cyber protection in order to ensure a steady, resilient power supply.







## Footnotes

<sup>1</sup> [The Guardian](#), India blackouts leave 700 million without power, July 31, 2012

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