

National Grid ESO Deploys GE Digital Effective Inertia Metering & Forecasting Solution

- *Inertia Metering solution provides National Grid ESO with confidence that the grid is running with enough inertia to keep the lights on*
- *Machine learning-based Inertia Forecasting informs short-term operational decisions and long-term investment assessments*

SAN RAMON, Calif. - APRIL 07, 2022 - [GE Digital](#) today announced that long-time customer [National Grid Electricity System Operator \(ESO\)](#) has deployed the software company's ground-breaking Effective Inertia Metering & Forecasting® solution in production across Great Britain's electricity network. Inertia is a critical factor as it keeps a grid running when a generator suddenly disconnects, buying time for other generators to ramp-up. The GE Digital solution is designed to deliver valuable capabilities to inform National Grid ESO's management and engineers of grid inertia day-to-day to help ensure the system can handle a worst-case generator loss.

Most inertia comes from big fossil fuel, nuclear, and hydro generation. With the shift to renewables, grid inertia is reducing. What's left is harder to measure because much of it is coming from demand, smaller generators, and grid behavior "beneath the surface." This makes life harder for system operators like National Grid ESO, and others across the world. Since inertia can be expensive and carbon-intensive, operators need to be confident they have enough while considering the cost to billpayers and emissions.

National Grid ESO and GE Digital have worked closely together to deploy the solution, built on GE Digital's energy platform for [Wide Area Management](#) (WAMS) applications. WAMS software is designed to provide system management through enhanced situational awareness, proactive grid management, and maximized transfer capability. The Effective Inertia Metering & Forecasting solution helps to provide confidence to operators about the margin and risk of their current and planned inertia positions. With analytics services, Effective Inertia Metering &

Forecasting measures the combined inertia-like effects of rotating machines, passive load responses, and active generator controls. The metering function is non-intrusive, just software, with no injection of forced stimulation or additional hardware into the network. WAMS data and analytics measure effective inertia in each regional area of the power system in real time and can combine them to a system-wide value.

The project featured a staged delivery with incremental software releases and close week-by-week collaboration between GE and National Grid ESO. This enabled rapid feedback and adaptation, helping to navigate external dependencies – such as links to external energy forecast systems – leading to successful acceptance testing of the new solution. With real-time inertia metering now live for more than 200 days and inertia forecasting for a number of weeks across the Scotland region of the Great Britain grid, all that remains is to install additional Phasor Measurement Units (PMUs) in a handful of remaining substations to complete the Great Britain regional inertia picture.

“This pioneering tool will improve the ESO’s ability to manage system stability across the entire network as more renewable energy sources connect to the grid,” said Julian Leslie, Head of Networks at National Grid ESO. “It forms a suite of world-leading technology procured by the ESO that will enable us to generate inertia in a greener way and map and monitor it rather than bringing on coal or gas plants when inertia levels are estimated to be low.”

To avoid issues, some operators have to manage inertia on a regional basis. They can also deploy fast-acting Wide Area Control schemes like those being deployed by GE Digital at [Landsnet](#) in Iceland and Australia. Such schemes act in less than a second to stabilize a grid following a disturbance. Having a real-time measure of regional inertia in the future will help them judge exactly how much injected power is needed in each location.

“Modernizing the power grid with technologies like Effective Inertia Metering & Forecasting help operators like National Grid ESO balance and stabilize renewables on the grid, optimize operations, and reduce costs and carbon in an increasingly



complex ecosystem,” said Jim Walsh, General Manager of GE Digital’s Grid Software business. “Our partnership with National Grid ESO is critical to advancing these solutions to keep up with the market globally.”

Click on this link for more information about GE Digital’s [Grid Software](#) portfolio.

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