

## GE Enhances Digital Power Plant Software and Extends Reliability and Efficiency Apps to Hydropower and the Electricity Grid

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- *Updated Digital Power Plant Solutions Protect Against More Failure Modes in Gas, Nuclear and Steam Plants; Give Electricity Traders Better Visibility into Generating Capacity to Increase Profitability*
- *GE Introduces Digital Hydro Plant, Digital Substation and Energy Management System Software to Portfolio of Digital Solutions for Power Producers, Utilities and Energy Managers.*

GE today announced a significant expansion of its suite of Predix\*-based software for power producers, grid operators and energy managers.

GE's latest release of Digital Power Plant software for gas, steam and nuclear plants features new tools to help customers reduce unplanned downtime by up to 5 percent, reduce false positive alerts by up to 75 percent and reduce operations and maintenance costs by up to 25 percent. It also includes software that provides power producers with accurate and timely plant operating capacity information which energy traders can use to generate incremental revenues.

Also unveiled today, the Digital Hydro Plant is GE's fourth major Predix-based Digital Power Plant solution. The Digital Hydro Plant extends GE's digital solutions to the hydropower vertical with possible benefits including up to 10 percent reduced maintenance costs, 1 percent increase in plant availability and up to 3 percent increased revenue.

Eight percent of all generated electricity never reaches its intended customer due to grid outages<sup>1</sup>. To address this challenge, GE has introduced a new set of Intelligent Digital Substation solutions for the electrical grid. These solutions include GE's asset monitoring & diagnostics and automation applications, based on its DS Agile Digital Control System. GE's Intelligent Digital Substations improve maintenance scheduling, optimize asset utilization, prevent failures and increase reliability of electrical grids by reducing power outage probability and duration.

Finally, a new intelligent energy management tool from Current, powered by GE, will help managers of commercial and industrial facilities use energy more efficiently.

"In just the past year, we've seen more than 30 international, state and private power producers and utilities begin their digital journeys with GE," said Ganesh Bell, chief digital officer, GE Power. "Today's announcements represent another major step forward in the digitalization of the industry. I believe we will look back on 2016 as a tipping point when digital transformation went mainstream."

### Announcements in Detail

- **Digital Hydro Plant** – Hydroelectric plants generate 17 percent of all the world's electricity<sup>2</sup> and are unique as the only source of energy that can be stored at utility scale, making it a strong stabilizing fuel to grids fed with growing intermittent sources such as solar and wind energies. With the Digital Hydro Plant, GE Renewable Energy introduces a suite of software apps and hardware solutions designed to help hydro customers enhance reliability, efficiency, cybersecurity and profitability over the lifetime of a plant. The suite includes:
  - **Asset Performance Management (APM)** – Predix APM can help reduce maintenance costs in hydroelectric plants by up to 10 percent. Predictive anomaly detection and long term prognostics can improve outage notification from hours to weeks in advance. APM can increase energy production availability by 1 percent by eliminating unplanned outages and enabling predictive maintenance.
  - **Operations Optimization** – This application provides plant operators with insights on plant performance relative to benchmark data and makes recommendations on how to improve

production capacity, efficiency, and flexibility. This enhances productivity, reduces the cost of electricity (LCoE) and improves outage management (from idle to full power down to 80s). The software focuses on indicators of thermal performance (which may indicate losses in output or efficiency) and operational flexibility (how well the plant can meet operational requirements).

- **Business Optimization** – Variability in water supply can make accurate day-ahead bidding difficult for hydroelectric plant operators. GE's business optimization application can help increase potential revenue by up to 3 percent by leveraging comparisons to historical and benchmark data to enhance short and long term energy forecasting.
- **GE Expands Failure Mode Coverage with industry best APM for Steam and Gas Digital Power Plants** – GE has expanded its catalog of analytics. These are algorithms which describe and predict power plant failure modes. The expanded catalog will help customers reduce unplanned downtime by up to 5 percent, and extend visibility into future failures by up to six months. GE has also reduced false positives by up to 75 percent compared to preexisting detection capabilities with analytics orchestration software, which triangulates and verifies related alerts. Lastly, new maintenance optimization capabilities, including those added through the acquisition of Meridium, will help customers prioritize maintenance by asset criticality. These new capabilities can help increase availability by up to 3 percent, reduce inventory costs by up to 3 percent and deliver an up to 30 percent reduction in reactive maintenance costs.
- **New Operations Optimization (OO) Software for Steam and Gas Digital Plants Gives Operators and Traders Real-Time Insights into Plant Capacity** – New software helps power producers increase plant capacity and revenue generation by connecting traders with real-time information about electricity generating capacity. These insights enable traders to make better decisions about day-ahead and day-of trading. A closed-loop technology solution (connecting cloud software with localized control systems) gives traders and plant operators the confidence that they can meet bid commitments and respond quickly to market opportunities. This capability has provided a 2–3 percent improvement in megawatt (MW) output for a typical 800MW plant with a corresponding revenue increase of \$5MM between maintenance cycles.
- **GE's DS Agile Control System for Intelligent Digital Substations** – brings complete monitoring and situational awareness of the grid substation. This will empower utilities and industry operators with the data, analytics and real-time optimization functionalities that are needed to more effectively manage the flow of electricity in transmission and distribution grids. In addition to this, the implementation of GE's Asset Performance Management applications will increase equipment availability while reducing maintenance and downtime cost. The Dynamic Line Rating applications will also allow customers to increase transmission lines' power capacity by up to 30 percent. Coupled with Wide Area Automation solutions, customers can further reduce power outages and service restoration times. GE's Digital Substation solutions will help substation operators enhance grid reliability, efficiency, power quality and continuity of electricity supply.
- **Intelligent Energy Management System from Current, powered by GE** – Current, GE's digital startup, announced today a new solution for intelligent energy management, revealing several national customers already using the tool to analyze and optimize energy across sites and systems. From lighting to HVAC systems, restaurant, retail and commercial businesses are using the solution to see exactly where and when energy is being used in real time, while powerful software enables not only historic, but predictive and prescriptive analytics. Data-driven building controls help shift energy during peak hours, enabling customers to proactively reduce costs. This tool not only offers energy outcomes through its digital infrastructure, but customers are also able to gather and analyze data to drive insights that improve productivity and operations.

1. According to the [World Bank](#) approximately 8% of electricity output is lost during transmission and distribution.
2. According to the [International Energy Agency](#) hydroelectric power accounted for 3982509 GWh of a total 23903353 GWh of worldwide electricity production in 2014.

## About GE

GE (NYSE: GE) is the world's Digital Industrial Company, transforming industry with software-defined machines and solutions that are connected, responsive and predictive. GE is organized around a global exchange of knowledge, the "GE Store," through which each business shares and accesses the same technology, markets, structure and intellect. Each invention further fuels innovation and application across our industrial sectors. With people, services, technology and scale, GE delivers better outcomes for customers by speaking the language of industry. [www.ge.com](http://www.ge.com)

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