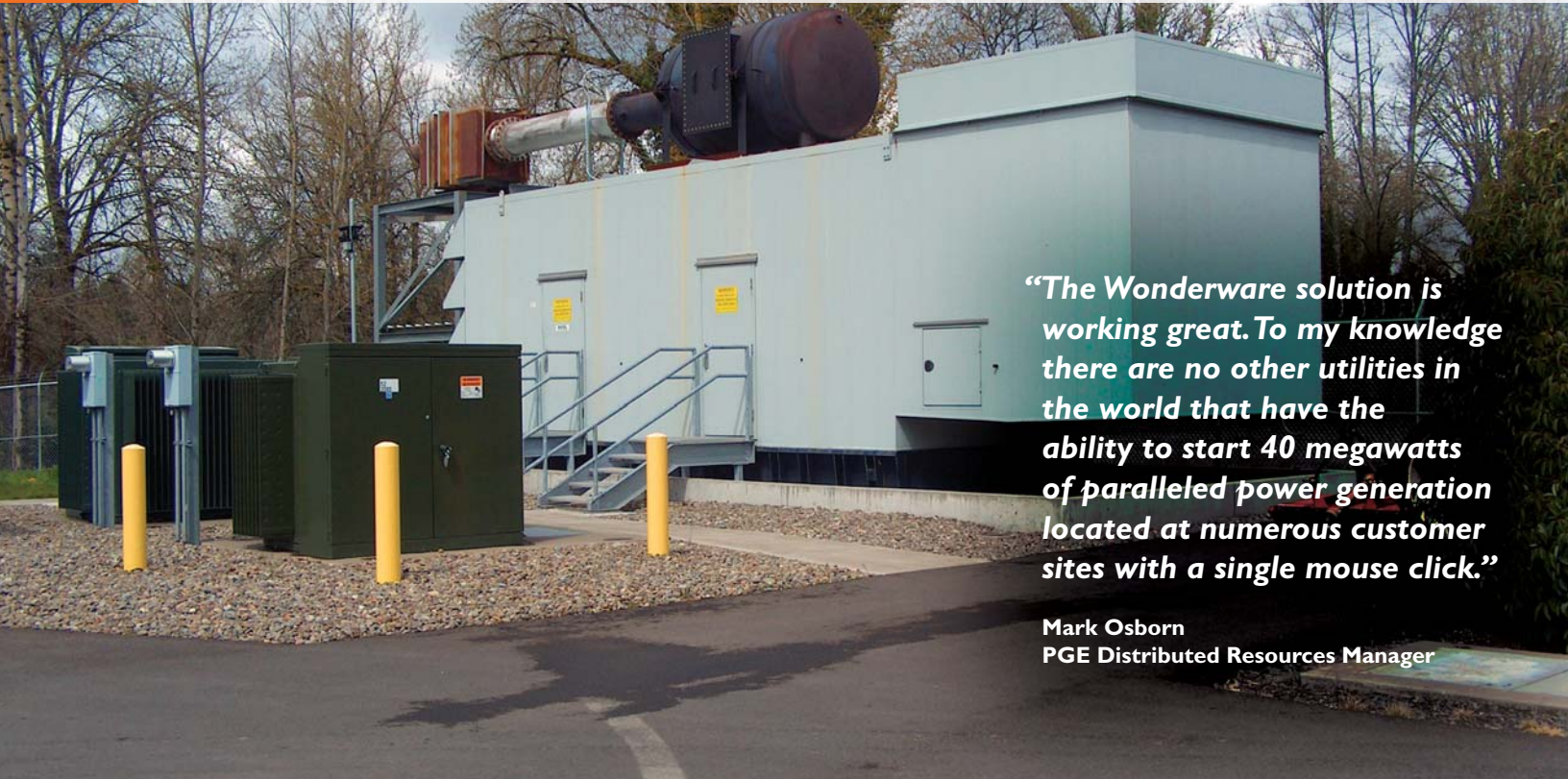


INDUSTRY: POWER

# Portland General Electric

www.portlandgeneral.com



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Mark Osborn  
PGE Distributed Resources Manager

## Wonderware Powers Oregon Electricity Demand

### Goals

- Supply ample and affordable power to 2 million residents of Portland
- Create reliable solution that can be reused throughout the plants owned and operated by Portland General Electric

### Challenges

- Megawatt cost skyrockets when there is power shortage from the grid
- Find a way to have an efficient and optimized plant with less emission

### Wonderware Solution

- Wonderware System Platform
- InTouch<sup>®</sup> HMI
- Wonderware Historian
- ActiveFactory<sup>®</sup> Trending, Analysis and Reporting Software

### Results

- Dispatchable Standby Generation (DSG) links 32 generators at 21 customer sites ensuring grid reliability at peak power demands.
- Improved efficiency of customer generators
- The system has enabled PGE to avoid buying wholesale power from the Western grid when prices are skyrocketing
- The system provide distributed real time monitoring, live video camera feed and an alarming system based on the IEEE-61850-420-7 object standard for all the sites



Software Solutions for Real-Time Success<sup>SM</sup>



## Portland General Electric

the 2,000-mile journey west to settle the Pacific Northwest. Helping the United States implement its Manifest Destiny strategy to expand the nation from the Atlantic to the Pacific, the wagon trail spanned over half the continent bringing settlers from as far east as Missouri to the Oregon Territory.

Today, Oregon is the ninth largest state in area and the Portland area is home to more than 2 million residents, making it the 24th most populous city in the country. To ensure that it can provide residents with ample and affordable electricity, Portland General Electric (PGE) implemented a demand-response program using Wonderware industrial automation and information software. The comprehensive automated system enables PGE to effectively manage peak electrical usage periods without a flicker.

## Dispatchable Standby Generation

PGE's demand-response program provides electrical grid capacity by linking customer-owned generators as part of a "virtual power plant" for its Dispatchable Standby Generation (DSG) program. With this system, PGE can simultaneously shave peak loads on the grid by using the available aggregated generation from customers emergency stand-by generators as part of their reserve capacity system. During peak periods when wholesale power is expensive PGE's EMS System Control Center uses this reserve generator capacity by turning on these generator assets with a single start push button. To do this PGE's has integrated their Distributed Standby Generator (DSG) System called "GenOnSys" with their EMS system control center "SCADA" system using the Wonderware System Platform.

During the 19th century, the Oregon Trail became synonymous with prosperity, opportunity and hope for a better life for the thousands of pioneers that braved

GenOnSys manages 45 MW at 21 customer sites with 32 generators that is spread out over a large geographical area. Also connected to the "GenOnSys" system are aggregated energy renewables such as fuel cells, micro turbines at a water treatment plant, a solar grid and a gas fired turbine. When all these sites are dispatched, they are aggregated as a single distributed virtual power plant that provides more load capacity to PGE at anytime when wholesale power becomes too expensive.

PGE "GenOnSys" Distributed Stand-by Generation system is an example where technology, a program and a business strategy really work together to provide the supplier and customer with cost and business benefits. This ends up driving better customer relationships. The benefit to PGE has been reducing the high costs of purchased power while providing a least cost peaking resource that increase the reliability of their substation feeders through peak shaving. The solution also reduces heat on their substation transformers. To manage this system only takes 4-6 people where other generating sites could take many more employees. The benefits of using this cost effective program has given PGE the ability to distribute and aggregate energy resources to support peak power demands. This has enabled the company to avoid buying wholesale power from the Western grid when prices are skyrocketing.

"When the Western power grid is short on power, we've seen the cost per megawatt skyrocket by up to 1200 percent," said Mark Osborn, PGE distributed resources manager. "But thanks to our DSG program operated by Wonderware software, PGE has been able to achieve a significant savings over market prices."

## Solving the challenge through Wonderware software

"The biggest challenge was to find a system that was easy to modify, could communicate with all types of equipment and the different manufacturer protocols we had to link together," Osborn said.

“It also had to communicate effectively with customer generators, solar inverters, substation equipment, relay protection, small wind and hydro generators. With Wonderware software’s powerful features and flexible communications capabilities, it proved to be the ideal solution to meet our needs.”

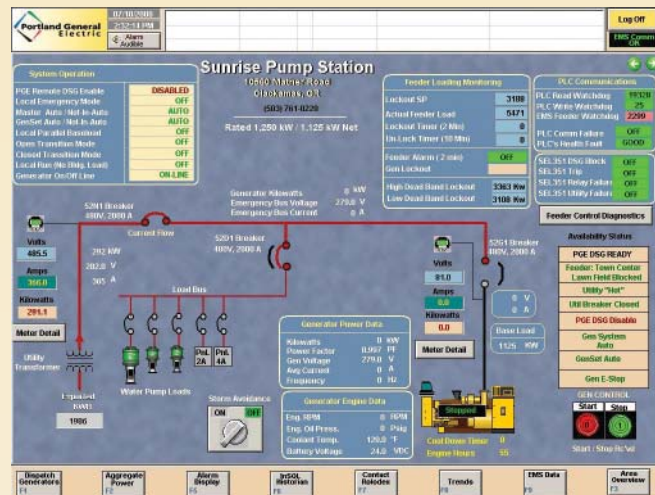
Using Wonderware System Platform 3.0 and InTouch 10.0, the “GenOnSys” is able to provide a distributed real time monitoring, live video cameras and alarming system based on the IEEE-61850-420-7 object standard for all the sites. This allows easy integration with the ION Enterprise Metering System, SQL Databases and Ethernet OPC Servers. While the solution is a SCADA system, it really is a set of applications that perform various generation information management functions where the Wonderware solution provides all the core functionality for the monitoring, alarming, analysis, and history services.

With GenOnSys, PGE has built an information system that quickly analyzes potential problems that helps improve the efficiency of their customer generators. If a generator should start either by an outage for emergency condition or dispatched a email and cell phone notification message is automatically sent to key personnel.

To engineer and design the “GenOnSys” System PGE selected Factory IQ as their System Integrator and software developer of choice because they needed a company that was experienced in SCADA and Enterprise Systems who could build a scalable interoperable architecture that would support all kinds of integration with different hardware, software and ERP solutions.

One of the greatest strengths of PGE “GenOnSys” is its ability to easily adapt to new site equipment, add new sites locally and put units on-line quickly,” said Parry, president of Factory IQ, Inc.. Because of the open architecture we built, PGE now uses a scalable and intelligent monitoring system.

“The Wonderware solution is working great,” Osborn said. “To my knowledge there are no other utilities in the world that have the ability to start 40 megawatts of paralleled power generation located at numerous customer sites with a single mouse click.”



## Reliable Uninterrupted Power

Providing reliable, uninterrupted power is one of the most critical issues in an energy-hungry world. Wonderware has demonstrated that it can play a key role in the Pacific Northwest, enabling Portland General Electric to meet electricity demand by managing a grid supplied by a wide variety of conventional and alternative power sources.

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