



Eversource Energy



Eversource transforms Direct Transfer Trip with LTE

Eversource Energy's LTE-based Real-Time Automation Controller provides situational awareness of renewable energy on the grid

QUICKFACTS

Company

Eversource Energy
www.eversource.com

Customer Profile

Eversource Energy is a publicly-traded Fortune 500 energy company headquartered in Berlin, Connecticut and Boston, Massachusetts. The company provides retail electricity, natural gas service and water service to approximately 4 million customers in Connecticut, Massachusetts and New Hampshire.

Objectives

- Develop reliable, secure Real-Time Automation Control (RTAC) to safely integrate renewables onto the grid
- Integrate communications solution that provides mission-critical reliability and security

Results

- Eversource RTAC integrates AirLink® MG90 which provides multi-network access to cellular and assures reliability
- AirLink Connection Manager enables secure communications

Sierra Wireless Products and Services

- AirLink® MG90, AirLink® Connection Manager



“ With the MG90 and ACM, we have the availability, latency and reliability we need to make this viable as the communications solution to support all the new renewable sources coming onto our network. Being connected to each of the “inputs” we have complete situational awareness of energy coming onto and leaving the grid, allowing us to effectively balance supply with customer demand. ”

Tim Callahan,
Senior Engineer, Distribution
Standards, Eversource Energy

BACKGROUND

Eversource Energy is a publicly-traded Fortune 500 energy company headquartered in Berlin, Connecticut and Boston, Massachusetts. The company provides retail electricity, natural gas service and water service to approximately 4 million customers in Connecticut, Massachusetts and New Hampshire.

CHALLENGE

According to the International Renewable Energy Agency¹ in April 2019, renewable energy accounts for one third of global power capacity. With governments around the world setting goals to increase power generation from renewables, and utilities setting objectives to make corresponding increases, integrating these new power sources into the grid is a challenge.

Eversource Energy provides electricity across three states and is working with many renewable energy companies that want to get their energy onto the grid. While the company needs to be able to accommodate these new producers, it needs to be able to do so safely. It’s not as simple as just giving a generator a connection to the grid. The nature of renewables is that they are unpredictable. Solar energy can only be generated when the sun is shining, and wind energy can only be generated when the wind is blowing.

As this energy comes onto the grid, the company needs “situational awareness” to balance supply and demand. During a fault in the system, utilities need to be able to quickly identify the source and isolate that segment of the distribution network to avoid damage to grid equipment and also protect utility workers servicing the fault. While the transmission network has long allowed for the integration of third party sources, it is a new challenge for the distribution network.

Utilities have used “direct transfer trip” (DTT) for many years, and DTT has always required highly reliable communications between all the components of the system. In the past, the energy company would have deployed copper telephone lines for this mission-critical communication, but with local telephone companies investing less in copper landlines, this has resulted in declining levels of communications service.

1. <https://www.irena.org/newsroom/pressreleases/2019/Apr/Renewable-Energy-Now-Accounts-for-a-Third-of-Global-Power-Capacity>

“ With the increasing cyberattacks on utilities, Eversource needed to ensure that all these communications could be protected via a virtual private network (VPN). The ACM sets up the VPN when the cellular connection is established, and automatically moves that encrypted tunnel to the new cellular network as required. ”



Tim Callahan, Senior Engineer, Distribution Standards, Eversource Energy

Eversource has been an early leader in integrating these new sources onto their distribution grid. Fiber optic cable was considered but can be cost-prohibitive. Eversource wanted cellular communications for this application and went in search of a solution that would meet its needs.

SOLUTION

Eversource evaluated a number of cellular solutions for this application. As the team worked through evaluation, it realized that to achieve the level of reliability they would need, they had to have a router that would support multiple cellular carrier networks.

Eversource developed a solution using a combination of SEL's RTAC and Sierra Wireless' MG90 cellular gateway to get the situational awareness it needed.

Eversource selected the AirLink® MG90 because it enables two cellular carrier connections in each router. Eversource can select one cellular network as “primary,” but in circumstances where a connection cannot be established on the primary network, the MG90 automatically selects and switches to the secondary cellular network. The switching happens automatically and transparently. When the primary cellular connection is reestablished, the router is switched back to the primary in real time. This multi-cellular capability provides the reliability Eversource needs.

“While the dual carrier aspect of the MG90 was a critical part of our decision, the AirLink® Connection Manager (ACM) was equally important for security. With the increasing cyberattacks on utilities, Eversource needed to ensure that all these communications could be protected via a virtual private network (VPN). The ACM sets up the VPN when the cellular connection is established, and automatically moves that encrypted tunnel to the new cellular network as required,” explained Tim Callahan, Senior Engineer, Distribution Standards at Eversource. “With the MG90 and ACM, we have the availability, latency and reliability we need to make this viable as the communications solution to support all the new renewable sources coming onto our network. Being connected to each of the “inputs” we have complete situational awareness of energy coming onto and leaving the grid, allowing us to effectively balance supply with customer demand.”





RESULTS

The sites that have been installed are up and running well and Eversource is in the process of deploying the new solution across its operating regions.

“The SEL RTAC and MG90 combination is going to be a great solution for our distribution management system (DMS) - safely bringing renewables onto the grid and enabling us to manage supply and demand effectively. We’re seeing new applications that make the packaged solution a building block for future grid operations,” said Callahan. “We are now looking at how it will help us in dynamic volt VAR optimization and DSCADA operations, also with electric vehicles, modelling and forecasting and streamlining distributed generation interconnection processes.”

Eversource is now examining integrating AirLink® Mobility Management into their operations. “With us using the RTAC and MG90 combination for each renewable source, we’re going to need a way to manage all these remote devices, and being able to have an on-premises system to do this makes sense,” said Callahan.

Many utilities are struggling to bring new generation sources to the grid, and Eversource sees the RTAC and MG90 package as a solution to the challenge. “We’re talking to other energy companies regularly and they are all looking for better ways to bring in new supplies safely.” Eversource credits its team of engineers – from protection and control, IT telecom and SCADA teams to making this solution a reality. Our team’s efforts to make this a great solution is really a credit to the talent of our team and the superior technology of our partners like Sierra Wireless and SEL,” explained Callahan.

About Sierra Wireless

Sierra Wireless (NASDAQ: SWIR) (TSX: SW) is the leading IoT solutions provider that combines devices, network and software to unlock value in the connected economy. Companies globally are adopting IoT to improve operational efficiency, create better customer experiences, improve their business models and create new revenue streams. Whether it’s a solution to help a business securely connect edge devices to the cloud, or a software/API solution to help manage processes associated with billions of connected assets, or a platform to extract real-time data to make the best business decisions, Sierra Wireless will work with you to create the right industry-specific solution for your next IoT endeavor. Sierra Wireless has more than 1,300 employees globally and operates R&D centers in North America, Europe and Asia.

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