

Avista Utilities

Spokane Smart Circuit

Abstract

Avista Utilities' (Avista) Spokane Smart Circuit project aims to reduce energy losses and improve reliability and efficiency in the electricity distribution system while reducing the need for new generation facilities. The project includes upgrading the distribution system by automating the management of the distribution grid and installing a rapid communications and monitoring infrastructure. New switches, capacitors, and sensors are being installed in substations and distribution circuits across the project area. This equipment provides automated regulation of power quality, rapid response to grid disturbances, and improvements to distribution reliability. A radio and fiber optic communications system integrates real-time data from grid sensors with the grid operator's distribution management software platform. The upgrades reduce the need for truck visits for system maintenance and operations and reduce costs and emissions.

Smart Grid Features

Communications infrastructure includes installation of new fiber optic cables and radio devices throughout the distribution network including 14 substations. A wireless mesh communications network forms a backhaul data link that connects the distribution sensors to grid operators. The monitoring of grid conditions provided by these systems enables more rapid response to power disturbances and increases overall grid reliability. In addition, remote equipment monitoring capabilities reduce the need for truck visits to distribution sites, which reduces costs and pollutant emissions.

Distribution automation systems include the installation of automated switches, capacitors, and reclosers throughout the project area, including 59 distribution circuits. This new equipment automates many grid management functions, such as the monitoring, isolating, and stabilizing of grid disturbances. The equipment is being integrated with a distribution management system software platform, which automatically protects and restores functional sections of the distribution grid during outages. Avista intends this automated distribution operations management to improve distribution system reliability by providing capabilities for more rapid and coordinated response than previously possible.

Distribution system energy efficiency improvements involve the integration of automated capacitors a power quality monitoring system. The network of capacitors and conductors improve voltage and VAR control, power quality, and increase distribution capacity by reducing energy losses on the distribution system.

At-A-Glance

Recipient: Avista Utilities

State: Washington

NERC Region: Western Electricity Coordinating Council

Total Budget: \$40,048,996

Federal Share: \$20,000,000

Project Type: Electric Distribution Systems

Equipment

- Distribution Automation Equipment for 59 out of 330 Circuits
 - Distribution Management System
 - Distribution Automation Communications Network
 - Automated Distribution Circuit Switches
 - Automated Capacitors
 - Equipment Condition Monitors
- Substation Automation/Upgrade for 14 out of 206 Substations
 - Supervisory Control and Data Acquisition Communications Network

Key Targeted Benefits

- Improved Electric Service Reliability and Power Quality
 - Reduced Costs from Equipment Failures and Distribution Line Losses
 - Reduced Operating and Maintenance Costs
 - Reduced Truck Fleet Fuel Usage
 - Reduced Greenhouse Gas Emissions
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Avista Utilities *(continued)*

Timeline

Key Milestones	Target Dates
Distribution automation installation start	Q4 2010
Communications infrastructure installation start	Q4 2010
Communications infrastructure installation completed	Q4 2011
Distribution automation installation completed	Q4 2011

Contact Information

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