



**MICROGRID
KNOWLEDGE**

CONFERENCE SERIES

Microgrid 2019
CONFERENCE

Aerial View: Blue Lake Rancheria Complex and PV Array



Source: PG&E

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Blue Lake Rancheria Microgrid Project

Challenge

- Demonstrate a low carbon-based microgrid for a critical community facility
- Install a microgrid that is capable of powering a Red Cross shelter in an emergency
- Integrate renewable photovoltaic and biomass power, battery storage, diesel generation, and controllable demands into an islandable microgrid

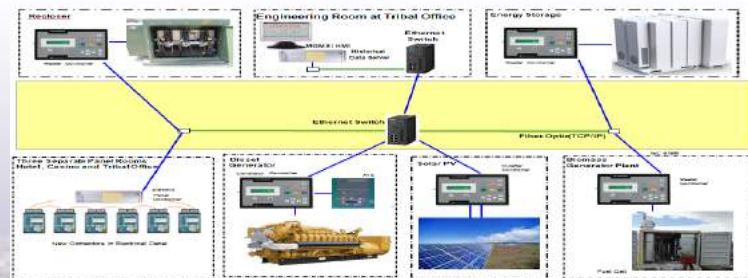


Solution

- Siemens Spectrum Power Microgrid Management System (MGMS), an advanced software control solution based on a powerful utility distribution SCADA platform, will be installed to integrate and automate:
 - 700 kW Load includes Casino, Hotel, Tribal Offices
 - 1 MW Diesel generator for base generation
 - Renewable generation sources including:
 - 175 kW Fuel cell + biomass
 - 500 kW Solar PV & 1000 kWh Battery
 - Economic dispatch of solar/battery system
- Siemens PTI Electrical System Stability and Grid Impact Study

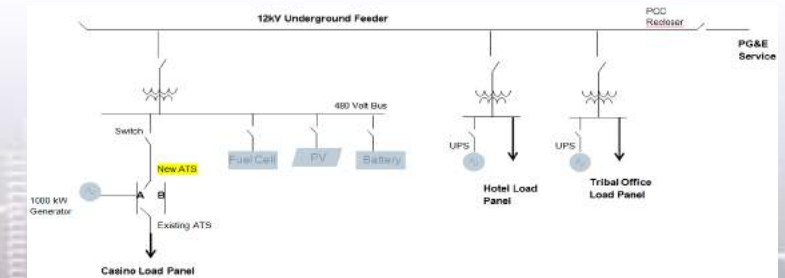
Benefits

- Provides the ability to island and supply uninterrupted electric power for at least 7 days during a real or simulated grid outage
- Achieves renewable energy generation > 40% of annual production
- Enables participation in one or more PG&E demand response programs
- Reduces annual electrical consumption from the grid of at least 680 MWh
- Achieves at least 25% energy cost savings over 1 year of operation
- Reduces annual greenhouse gas emissions by at least 195 metric tons CO₂



Project Profile

- Blue Lake Rancheria - Blue Lake, CA
- Native American Reservation
- Estimated Peak Load: ~700KW
- Project Partners: PG&E, Idaho National Lab, Humboldt University Schatz Energy Research Center, California Energy Commission
- Project start date January 2017



Blue Lake Rancheria – Islandable Power System

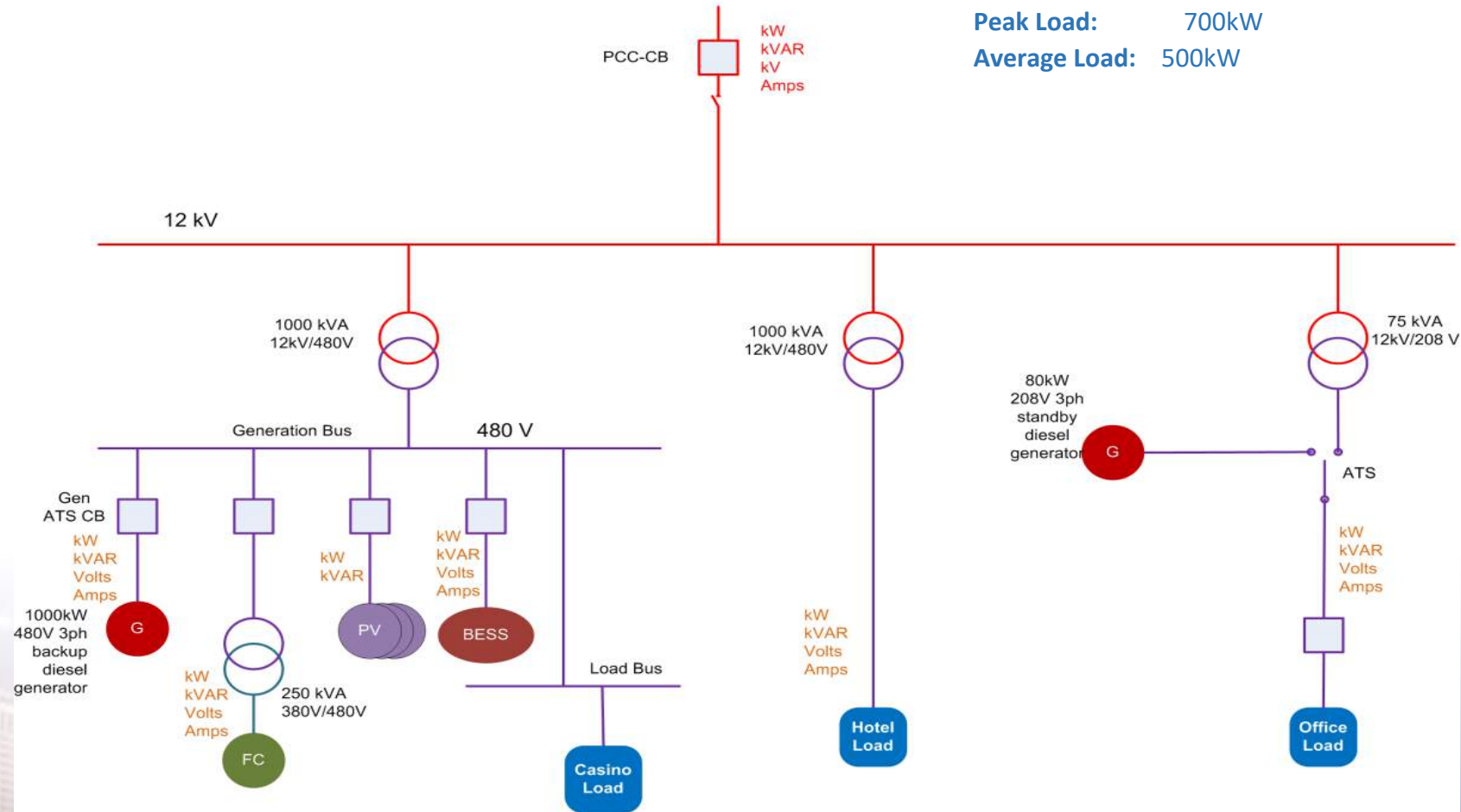
Blue Lake Rancheria Microgrid

Controllable Assets

- Diesel Generator: 1000 kW
- Biomass Fuel Cell: 175 kW
- Solar PV: 430 kW (peak)
- Battery: 500 kW/1000 kWh
- Automatic Transfer Switch
- PCC Breaker
- Three groups of loads

Functions

- Electrical load forecast
- Renewable generation forecast
- Excess PV curtailment
- Generation and storage optimization
- Islanding, black start, and resynch
- Demand response scheduling



Peak Load: 700kW
Average Load: 500kW