



Saft's energy storage package is increasing hydropower usage for an Alaskan microgrid

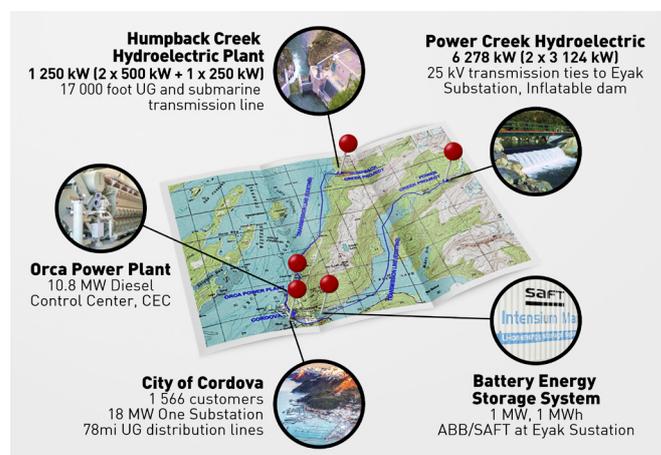
In June 2019, less than 12 months from award to receipt of contract, Saft delivered a complete energy storage package, including an Intensium® Max Energy Storage System (ESS) and power conversion, to enable a remote Alaskan city to save diesel fuel by making better use of its abundant hydropower resources.

OVERVIEW

Enhancing independence and resilience in remote Cordova

Cordova lies at the mouth of the Copper River, a thriving salmon fishing river. With no grid connection, the city relies on a microgrid managed by the **Cordova Electric Cooperative (CEC)**. CEC meets the town's baseload with run-of-river hydro generators rated at 6 MW and 1.25 MW. In addition, a 1 MW diesel genset provides support for the transition from hydropower during the winter freeze and the peak summer demand.

CEC wanted to install an ESS to improve its resilience, reduce its reliance on imported diesel fuel and make the most of its hydropower, which is 10 times cheaper than diesel, in the spring as fish processing plants ramp up production.



Credit photo: Cordova Electrical Grid

Cordova Electric Corporation (CEC):

- CEC's microgrid serves 1,566 customers with a single substation and over 125 km of underground distribution. The maximum load is about 7MW.
- Generation capacity includes hydro generators with a total output of 7.25 MW and a 10.8 MW diesel plant.
- Hydropower cost of \$0.06/kWh compares with \$0.60/kWh for diesel.
- Over 1 MW of hydro capacity can be wasted during the transition from hydro-only operation to hydro and gensets which can last for days at a time.
- CEC will rely on energy storage for additional spinning reserve to maximize hydropower and delay the need to start the gensets.
- Cordova is only accessible by water and air.

THE NEEDS

Saving diesel fuel and runtime during seasonal transition

In hydro-only mode, operators control CEC's grid frequency by diverting part of the water stream away from the turbines to modulate their power output. However, with run-of-river hydro being a use-it-or-lose-it resource, deflected water simply flows down the river and the energy is lost.

As workers switch on equipment at the start of the salmon season, CEC transitions from hydro-only to a combination of hydro and diesel generation. With the diesel needing to be run at a minimum output level and some hydro being deflected to maintain spinning reserves, over 1 MW of hydro can be lost during such transition periods.

CEC now uses an ESS to help offset the use of diesel generators and reduce the spillage of hydropower.

The optimum power and energy of the ESS had been determined by CEC and its consultants through modeling with CEC's generation and load data.

The operating philosophy uses the ESS to control the frequency and provide spinning reserve, allowing CEC to make full use of its hydro resources.

The fully automatic control system switches gensets on and off as a function of battery SOC information provided by the ESS.

THE SOLUTION

Saft ESS and power conversion package

- ESS rated at 1 MW power with 1 MWh storage capacity
- Specification based on CEC's recorded generation and consumption data
- Power converter based on ABB technology
- Housed in standard sized containers
- High-speed controller integrates with grid
- Incorporates battery management, active cooling, monitoring and power and communication interfaces

Functions and purpose of the ESS:

- Load following - maximizing hydro utilization and displacing diesel
- Spinning reserves - emergency supply and resilience

Key benefits:

- ✓ Initially estimated fuel savings of 35,000 gallons per year are trending towards 70,000 gallons
- ✓ Designed for optimized Life Cycle Cost (LCC)
- ✓ Technology proven in operation in other Alaskan projects
- ✓ Readily transportable for shipping to Cordova
- ✓ Modeling provided certainty of performance and financial payback
- ✓ Other diesel variable cost savings (lubrication, maintenance) likely represent as much economic savings as fuel
- ✓ Significantly extended periods of hydro-only generation: In April 2020, started 3 weeks earlier than previous year



« The ESS was installed in June 2019 and in operation in July. Over the two-day Thanksgiving holiday in 2019, the system reached 94% of hydrogeneration, crushing all previous records and thus saving \$10K in only two days. The original estimate of 35,000 gallons of fuel savings per year is trending to double this original estimate. »

Clay Koplin, CEO of Cordova Electric, Corporation and Mayor, City of Cordova

Want to know more about Saft's Intensium® Max Energy Storage System ?

Contact Experts

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