Battery Energy Storage System (BESS)

Completed in December 2003, the BESS is one of GVEA's initiatives to improve the reliability of service to GVEA members. In the event of a generation or transmission related outage, it can provide 27 megawatts of power for 15 minutes. That's enough time for the co-op to start up local generation when there are problems with the Intertie or power plants in Anchorage.

One of the requirements for construction of the Intertie was a reactive power supply capable of delivering power should generation fail. As shown below, the BESS has been meeting those needs.

Outages Prevented

Year	Total number of outages covered*	Avg. Number of prevented outages per meter
2003	3	Less than one
2004	56	7
2005	34	5.6
2006	82	7.5

2007	65	9
2008	25	2.3
2009	28	2.6
2010	40	3.9

** Outages covered include both local generation and transmission outages and outages due to loss of power from Anchorage via the Intertie.*

BESS at work for you

Here's how the BESS works. When GVEA brings power up the Intertie from Anchorage utilities and one of their generators loses power, some of our members experience an outage. The same happens if we lose one of our own generators. But with the BESS, we can cover 27 megawatts of power instantly. This gives GVEA time to start up local generation. This means fewer outages.

However, the BESS can't help in all situations. If a tree falls in a line near your house, until that line is repaired, you're cut off from the system.

We anticipated a 60 percent reduction in power supply type outages and we're exceeding that number. The Outages Prevented chart above shows how the BESS has been preventing outages for our members. As planned, the operation is so seamless members don't even know the BESS is at work.

Technology

At the heart of the world's most powerful energy storage battery are two core components: the Nickel-Cadmium (Ni-Cad) batteries, developed by Saft, and the converter, designed and supplied by ABB. The converter changes the batteries' DC power into AC power ready for use in GVEA's transmission system.

Participants

- **ABB** - primary design and controls engineering.
- **Saft** - construction of the Ni-Cad batteries at their Swedish facilities. This will be a cradle-to-grave operation, as Saft is fully responsible for the recycling and/or disposal of each battery.
- **City Electric** - general contractor for ABB.

Awards Received

- ABB was awarded the Platts 2003 Global Energy Award for their design and development of the BESS converter.
- The Electric Power Resarch Institue Technology Award for the BESS project at the National Rural Electric Cooperative Association Annual Meeting on February 15 2004.
- Guiness World Record certificate acknowledging that the BESS is the world's most powerful battery on December 10, 2003. During a test of its maximum limit, it discharged 46 megawatts for five minutes

Funding - $35 million

Golden Valley Electric Association

Statistics

- 13,760 liquid electrolyte-filled Ni-Cad cells
- Each battery is roughly the size of a large PC and weighs 165 pounds
- Total BESS weight - 1,500 tons
- Batteries have an anticipated life of 20-30 years .