

ABB builds world's largest battery backup system

The Golden Valley Electric Association Inc. (GVEA), a cooperative serving the Fairbanks, Alaska, area, is installing the world's largest battery energy storage system (BESS). The project is part of GVEA's program to ensure a reliable



Alaska: The USA's biggest state is to get the world's largest battery energy storage system.

supply of electric energy for the region, where long supply lines and remote consumers are the rule and where outside temperatures can drop to -51°C . At such temperatures, water pipes in homes would freeze in about two hours if the power supply should fail!

While it would be possible to keep existing gas turbine power plants running to provide emergency energy backup known as 'spinning reserve', this option is economically as well as ecologically questionable. GVEA therefore decided on a unique solution: an energy storage system based on a high-performance nickel-cadmium (NiCd) battery. Its 13,760 energy cells, in four strings, are able to feed the power grid in an emergency with 40 MW for

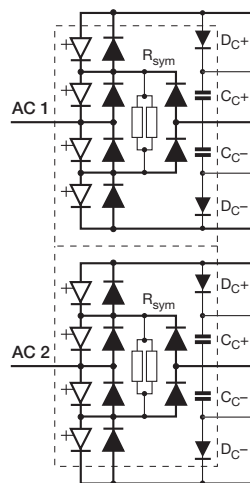
6–7 minutes or 26 MW for 15 minutes. This is enough to allow the utility to start up gas turbines and get backup generation on line.

GVEA placed the US\$ 30 million order for the system with an ABB-led consortium that includes SAFT-Alcatel. The project is scheduled for completion by mid-2003.

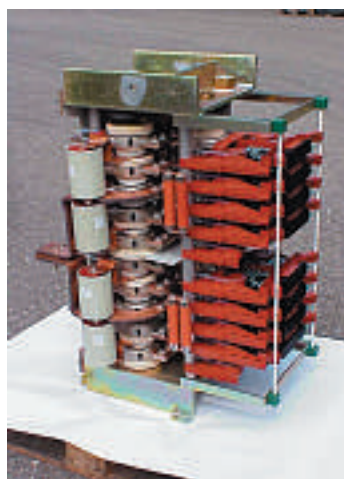
IGCT converter is at the heart of the system

The energy storage system consists of the NiCd battery unit, power conversion modules, switchgear, transformers, metering, protection and control systems as well as service equipment.

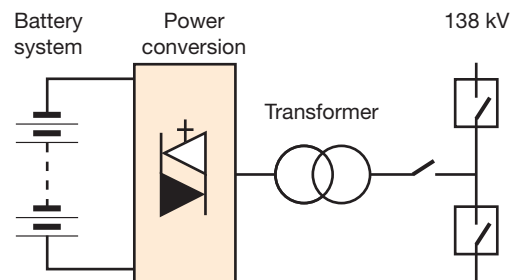
The semiconductor devices used for the frequency conversion are IGCTs (Integrated Gate Commutated Thyristors). The IGCT is a high-power semiconductor that combines the benefits of low switching and low conducting losses. A three-level converter design (Neutral Point Clamped – NPC) was chosen because of its superior harmonic performance, which makes additional filtering unnecessary. The power electronics equipment is water-cooled in a closed loop.



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Dual-stack converter module with IGCTs



Main components of the battery energy storage system (BESS)

NiCd battery stores the energy

Life cycle analysis has shown the NiCd battery to be superior to other types, with full functionality ensured over the expected 20–25 year life span. High availability is also guaranteed by its very good discharge/charge withstand capability, which minimizes any effect on battery life. Battery maintenance is kept simple, with half-yearly voltage checks and periodic water additions.

Bess is designed primarily to come on line and pick up load in just a few milliseconds, but, since its converter also generates reactive power, it will be used most of the time to regulate the voltage – a further advantage of the advanced power electronics employed.

GVEA estimates that BESS will result in a 70% reduction in power supply outages.

Hat-trick!**ABB again top of the class in corporate sustainability**

In 2001, ABB was ranked number one, for the third time in a row, in corporate sustainability in the electric components and equipment industry.

This ranking was determined after assessments carried out by SAM (Sustainable Asset Management), an independent asset management company. Together with Dow Jones & Company, SAM launched the world's first index to track the performance of sustainability-driven companies worldwide. This index, known as the *Dow Jones Sustainability Index* (DJSI), is widely regarded as a benchmark for financial products based on corporate sustainability performance indicators.

What is sustainability?

According to SAM, sustainability is a 'development strategy that meets the needs of the present without compromising the ability of future generations to meet their own needs. It calls for a future-oriented perspective which integrates economic, environmental and social aspects.' The concept of sustainability has become of paramount importance to business, and more and more companies are turning to corporate sustainability as a new business approach by integrating economic, environmental and social



criteria into their strategy and management.

The SAM Annual Review examines the corporate sustainability performance of the largest 2,500 companies in the world, based on the answers given in an extensive questionnaire, as well as further document analysis. The top 10% are selected for the DJSI and are identified as sustainability leaders. These sustainability leaders are further assessed and points are awarded based on the company's involvement and management of critical environmental, economic and social issues or potentially reputation-damaging crisis situations. The consistency of a company's behavior and management of crisis situations is reviewed in line with its stated principles and policies and track record.

What does sustainability mean to ABB?

Companies in the electric equipment sector constantly face rapidly evolving markets. And as the demand for energy increases, these companies must adapt to growing needs for cleaner, renewable and distributed energy by addressing key issues such as energy efficiency, product safety and waste minimization. For many years, ABB has been committed to sustainable development, which it sees as integral to all aspects of its business management, and has striven to balance economic, environmental and social requirements. ABB has stated that its goals are to continuously improve its own social and environmental performance and to take initiatives that improve the quality of life of its employees and their families, and the local communities and society at large in the countries in which ABB operates.



ABB is committed to sustainable development, which it supports by:

- Ensuring that all operations and processes comply with applicable environmental standards and legislation, and that every operating unit develops and implements an Environmental Management System that continuously improves its environmental performance.
- Developing and supplying eco-efficient products, systems and services with tomorrow's standards in mind, and that achieve reduced environmental impact over their complete life cycles.
- Sharing state-of-the-art technologies with emerging markets.
- Applying ABB's social policy throughout the Group and developing implementation processes and measurement indicators to help continuously raise social performance.
- Favoring and encouraging suppliers who have similar environmental and social policies and systems.
- Being a partner in societal initiatives that foster economic, environmental, social and educational development.

SAM ranked ABB above the industry average and best in its group in corporate governance, social policy and environmental performance. To be ranked *number one* in corporate sustainability among the electric components and equipment industry is itself an acknowledgement of ABB's efforts; to hold this position *three years in a row* demonstrates the effectiveness of these efforts.