

Landsvirkjun works with Eaton

To bring reliable and environmental reserve power solution to its Iceland HQ

Location:

Reykjavik, Iceland.

Challenge:

Data Center / Utilities

Solution:

Eaton 93PM 200 kVA Super Capacitor solution Intelligent Power Manager (IPM) Infrastructure Energy Saver System

Results:

Reduced CAPEX, infrastructure costs and greater scalability
Reduced maintenance costs Lower environmental impact Estimated saving of €10,000 per year from eliminating outages

“We were very happy working with Eaton because typically large manufacturers do not work with their customers to custom build the distribution panels.”

Óskar Valtýsson

Background

Landsvirkjun, the National Power Company of Iceland, is Iceland's largest electricity generator and one of the ten largest producers of renewable energy in Europe. Landsvirkjun operates 18 power plants in Iceland, and they also operate two windmills as a research and development test site.

The company is progressive and known for being an early adopter of technology, as well as at the forefront of clean energy and renewables.

For years, Landsvirkjun has operated a reserve power system in the company's headquarters in Reykjavik. These have been designed to keep the company's mission critical data center, its data network and communications systems operational in the event of a utility power failure or a power outage at the headquarters. Crucially, for a volcanic country, the reserve power systems are also designed to ensure that the company's emergency response management facilities, also located in the company's headquarters, remain in operation during prolonged outages or in case of nationwide natural disasters.

Challenge

Landsvirkjun recognized the need to implement a new reserve power solution to overcome the limitations and drawbacks from its existing solution.

The disadvantage of its older power backup system was that it wasn't powerful enough to keep most of the building operational during outages. Its existing backup solution, based on lead batteries, could only generate enough power to keep critical systems online and could not provide power to other systems, including the building's lighting, elevators, ventilation and other electric appliance. Even though the existing UPS had 16 hours runtime, the data center could only operate for a few hours and most employees were unable to do any work and had to be evacuated.

At the same time, there had been repeated damage to electrical equipment in the building due to the interference and electric disturbance from either a utility- or power-outage, such as when performing annual reserve power system tests. Even starting the diesel generator for backup power had damaged equipment, such as knocking an elevator out of action.



Powering Business Worldwide

Alongside this, Landsvirkjun wanted a more environmentally friendly solution to replace the lead-acid batteries. Its team was concerned that these had to be replaced every four years, which it considered a terrible waste and it leaves a large carbon footprint.

The goals for the new solution were to provide a better power reserve that was more capable of keeping the company's operations running in the event of power outages, while preventing any electrical disruption and electric power disturbances across the building, and which matched the company's commitment to the environment.

Its key requirements were:

- Increase the operational security of the company's mission critical data centre, data network and EMS/SCADA communications systems
- Minimise disruption from power outages
- Prevent damage to electrical systems and equipment
- Reduce supervision and maintenance costs of the reserve power system
- Minimise environmental impact
- Save energy

Solution

Landsvirkjun worked with Eaton to build a new reserve power system based on the most up-to-date, efficient and clean technology available.

Óskar Valtýsson is Landsvirkjun's head of telecoms and technology. He was committed to the idea of implementing a forward-looking system that would transform the organization's reserve energy system. He had previously implemented other progressive technology installations within Landsvirkjun, including a mobile communications system, and had thoroughly researched the potential new technologies.

According to Óskar, "Landsvirkjun is always searching for ways to increase efficiency and any upgrade gives a chance to find efficiencies over existing equipment."

Óskar Valtýsson was responsible for the design and commissioning of the new

solution – basing the design on supercapacitors – and chose to work with Eaton because of its background and heritage in power technology.

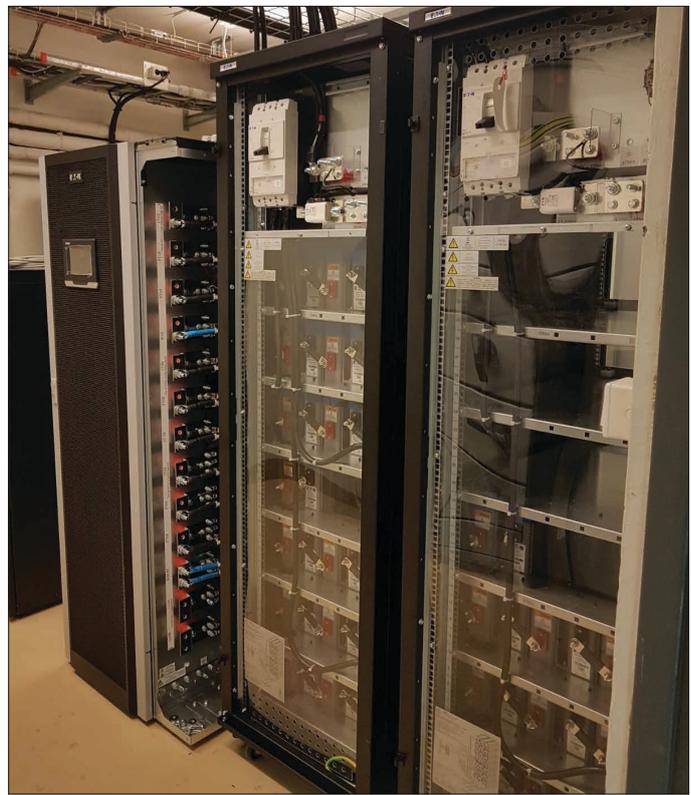
Valtýsson was attracted to supercapacitors because of both their long service life of 20+ years and because they can be charged and discharged almost infinitely, making them much more environmentally-friendly than traditional battery technologies. Supercapacitors are suited in applications where they provide bridge power until backup generators kick in.

Óskar presented a sketch of an idea to various UPS manufacturers. Most said that the solution couldn't be delivered because of the reliability concerns with using new technologies, however Eaton immediately confirmed it could provide a solution based on his ideas and requirements because it had tested its supercapacitor technology robustly and knew it would deliver the required quality of service.

Landsvirkjun's new solution is based on the combination of a diesel generator with supercapacitors. This was a leap forward from the old system, which had used conventional lead-acid batteries. The pronounced change meant those outside the technical team at Landsvirkjun required convincing that the new solution would be as reliable as its existing system, which was a known quantity. However, Óskar was able to demonstrate that the combination of diesel generators, which are almost 100% reliable, with 'military grade' supercapacitors meant that the company couldn't be safer.

Once the decision had been made to go-ahead, the project was completed in just over one month. "In Iceland, it always seems that decisions are made very fast and projects completed quickly," said Óskar Valtýsson.

Alongside the UPS installation, Eaton was supported by an electric contractor, Rafvellir, who was responsible for the on-site cabling and installation. Eaton provided a custom-built electrical distribution panel with maintenance bypass switch, saving Landsvirkjun the time and expense of sourcing their own electrical contractor.



Results

Landsvirkjun's new reserve power backup solution is based on Eaton 93PM 200 kVA supercapacitor UPS and Eaton Intelligent Power Management (IPM) software, with greater efficiencies enabled through Eaton's Energy Saver System.

The unique characteristics of the Eaton Supercapacitors combine to make them the most economical alternative for a backup power solution. They enable Landsvirkjun to benefit from reduced CAPEX due to a longer lifetime of 20+ years, compared to the 10-year lifecycle of the previous UPS system and four-year lifecycle of the accompanying lead-acid batteries. This resulted in lower infrastructure costs and greater scalability for the business; they also enable lower operating costs due to being almost entirely maintenance-free. Furthermore, they also provide complete peace of mind due to the reliability, quality and seamless, validated integration with Eaton UPSs.

Eaton's Energy Saver System, described as "ingenious" by Óskar Valtýsson, delivered benefits by minimizing the heat in the UPS's operation, lowering cooling costs, and maximizing efficiency.

Landsvirkjun uses Eaton IPM to give visibility across its power infrastructure, to help with a graceful shutdown of equipment and bringing systems back.

The UPS backup system runs in Energy Saving Mode, ensuring it delivers cost savings, but this was never the primary goal of the project. Instead, the main benefit to Landsvirkjun comes from securing the operations in its headquarters and from removing the cost of damage to equipment from outages, estimated at €10,000 per year. The company has also saved money because it no longer needs to invest in a load bank when emulating a utility outage.

The first tests of the system have gone exactly to plan and were carried out when people had left the building. The old UPS was switched to bypass mode and all the old batteries were taken away, after that Óskar Valtýsson and his team recreated a utility failure. The Eaton UPS provided bridge power until the generator took over. During the test, the 93PM supercapacitor UPS even provided enough power for the building's elevators to function normally, something Óskar Valtýsson considered a huge testament to its success.

"We got very good service from Eaton; the team was always ready to talk to us, at any time, which was very reassuring. They were very willing and gave us guidance at every step. We always felt important to them," said Óskar Valtýsson.



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