Ease and simplicity – planning a data centre's power protection

Location:
The Netherlands

Segment:
Data Centre

Problem:
When starting to design, Previder wanted to ensure that its customers would get a future-proof data centre.

Solution:
Previder chose Eaton® to build the entire electrical system, which includes everything that is needed for a functional electrical system, including medium-voltage switchgear panels, main and data centre rooms' low-voltage switchgear panels, bus bars or bus ducts and UPS systems.

Results:
"Choosing Eaton's turnkey system saved us a lot of time and brought us remarkable financial benefits," says Marco Alink, facility manager in PDC2, Previder

Contact Information
To learn more about Eaton data centre solutions, please visit www.eaton.eu/datacentres

Background

With its two high-tech data centres, Previder is one of the top service providers of ICT, data centre, cloud and internet services in the Netherlands. Opened in 2010, Previder's PDC2 is the largest carrier-neutral data centre in eastern Netherlands, with four separated rooms and a surface area of 2,500 square metres. While in western Netherlands many data centres are below sea level, Previder's data centre, at 14 metres above sea level, offers the certainty of dry feet. This seems to be a powerful argument for many clients.

In addition to renting rack space, users of PDC2 also have extensive work and meeting spaces at their disposal.

Challenge

When starting to design PDC2, Previder wanted to ensure that its customers would get a future-proof data centre. This meant certain issues with the data centre's connectivity, electrical supply and energy efficiency had to be carefully addressed using the most modern technologies.

Solution

Previder chose Eaton to build the entire electrical system. They selected an Eaton total turnkey system which includes everything that is needed for a functional electrical system, including medium-voltage switchgear panels, main and data centre rooms' low-voltage switchgear panels, bus bars or bus ducts and UPS systems.

"We had one single contact at Eaton who provided a fast response to all of our queries, and all equipment could be bought with one stop shopping. Choosing Eaton's turnkey system saved us a lot of time and brought us remarkable financial benefits," says Marco Alink, Facility Manager in PDC2, Previder.

The project's planning was done by Previder, Lesscher – the main electrical contractor, and Eaton. The product installation and implementation was done in co-operation with Eaton and Lesscher.

Previder's primary focus is on maintaining the availability and accessibility of data and all of their efforts are targeted towards this goal. "We aim for maximum redundancy," Alink says. "Whether it's a matter of power supply, fire safety or cooling, everything is done several times over. We don't leave anything to chance."

PDC2 has four individual data centre rooms. Each room is physically separated from the other and is equipped with its own electrical, cooling, fire and management systems to ensure that a failure in one room will not affect the servers in the other rooms.

At PDC2, the power supply system was built as a TIER3+ installation and is also ISO 27001 certified. All crucial systems in each data room – such as the electricity supply, emergency power supply,

air-conditioning and network connections – are duplicated in accordance with the N+1 principle. The redundancy standards used – N+1, N+2 and 2*(N+1) – ensure that chances of failure are minimised by a second or even a third back-up system. The most critical systems even have double redundancy (N+2).

Each data room is designed to have a 2N UPS solution with two separate A and B electricity feeds. Within the project, Eaton has delivered the UPS system for data room 1, which has an IT load of one megawatt. The system consists of six 9395 UPSs, of 550 kVA each. Each feed has two UPS systems in use and one for redundancy. The system is fully redundant, because each power feed is capable of providing enough power for every data room's load in the case of failure in another power feed. The redundancy of the UPS is based on Eaton's Powerware Hot Sync® load-sharing technology, which enables the units to operate completely independently in parallel.

In order to cut energy usage and achieve best possible efficiency without affecting uptime, data room 1's UPSs utilise Eaton´s energy saving technologies. Two different

technologies were chosen to share the risk of power failure.

Feed A's UPS system utilises Eaton's Energy Saver System (ESS), which enables the UPS to reach 99 per cent efficiency without sacrificing reliability, while power feed B uses Variable Module Management System (VMMS) technology for optimal employment of UPS power modules.

In normal circumstances, both feeds are used at the same time (2N). Each feed only works on half load at maximum. In the case of total failure in one feed the other will take over the total load, still working on the N+1 setup.

The environment was one of the factors taken into consideration when PDC2 was being built. The aim is to achieve a power usage effectiveness (PUE) value of 1.25, which means that only 25 per cent of the power will be used for supporting systems. Many other data centres have a PUE value of 2.0. This makes PDC2 one of the greenest data centres in the Netherlands. Previder exclusively uses green power and cooling is handled by an environmentally-friendly free-to-air cooling system.

Results

The PDC2 project took one year to move from first designs to commissioning. Now the first data room is up and running and Previder will gradually start using the remaining data rooms. In their future data rooms, Previder will use a similar UPS set-up to the one already in use. They are also planning to build another data centre in Hengelo with total IT power of 16 megawatts.

"We were very satisfied with the end result Eaton delivered for PDC2," Alink concludes. "For us, it's about maximum stability and that's another reason why we chose Eaton.
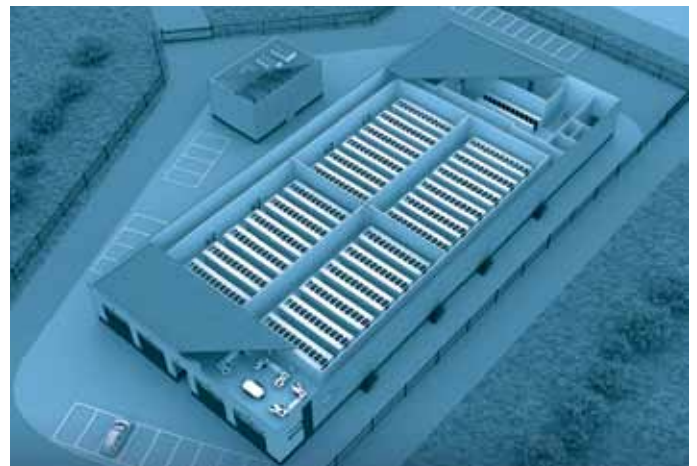
They have extensive experience with data centres and are experienced with low and medium voltages. The good maintenance contracts and attractive prices which we agreed for the whole project testify to this. The positive experiences we have had at this centre form an excellent prelude to establishing another twin data centre here in Hengelo."

Eaton 9395 550 kVA UPS

Eaton Total Turnkey System

- Two Eaton ELatis distribution enclosure systems
- Two 4,000 A Eaton Capitole 40 switchgears and control gears
- One 6,300 A Eaton Capitole 40 low-voltage emergency switchgear and control gear
- Two Xiria ring cable stations
- Transformers
- Medium-voltage switchgear panels in main and data centre room
- Low-voltage switchgear panels in main and data centre room
- MEM Busbars/Busducts
- TIER III+ Installation (redundant transformers and 2N UPS solutions per unit/data room)
- UPS system
  – 6 x Eaton 9395 UPS 550 kVA Hot Sync, built up as a 2N solution (A + B Feed)
  – Each feed N+1 = 3 x 550 kVA N+1 Feed A and 3 x 550 kVA N+1 Feed B
  – Feed A on ESS Mode
  – Feed B on VMMS Mode
  – Powerware Hot Sync technology

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