Customer: **University Of Bristol**

MULTI SENTRY MAKEOVER ACHIEVES FIRST CLASS SAVINGS FOR UNIVERSITY

Upgrading power protection at the University's world-class High Performance Computing (HPC) Centre delivers efficiency savings worth nearly £100,000 a year.

Founded in 1876, the University of Bristol enjoys a well-earned reputation as one of the leading research institutions in the UK. Its alumni include several Nobel Laureates such as Paul Dirac, Sir Nevill Mott, and Sir Winston Churchill.

The University's High Performance Computing (HPC) Centre is recognised as one of the country's foremost academic hubs. Its processing power aides research topics as diverse as physics, including quantum mechanics and nanoscience, through to climate modelling, engineering, chemistry simulations, and even language studies.

Today, the HPC Centre is home to 'BlueCrystal', one of the UK's most advanced supercomputing facilities. It is capable of a staggering 600 trillion calculations a second. Scientists even use it to model the evolution of galaxies.

The existing 1 MVA HPC Centre was built in 2009. While the technologies were cutting-edge at the time of installation, fast-forward nearly a decade and they weren't up to the challenges posed by the modern, energy-efficient world.

The University has strong environmental and sustainability policies, including a target to be carbon neutral by 2030.

With this in mind, the it decided to upgrade the electrical infrastructure throughout the HPC Centre to the latest, most energy-efficient solutions.

Certified Riello UPS reseller UPS Systems plc was the University's perfect project partner. The company brings more than 25 years' experience providing a comprehensive range of power protection products, installation, and maintenance services to data centres and other similarly mission-critical environments.

UNIVERSITY CHALLENGE

Jack Ogden, Commercial Director for UPS Systems plc, explains: “Access to the HPC facilities is essential for academic and research staff carrying out their vital work. It’s a continuously operating environment, so there wasn’t the option to close it down during the upgrade. Zero interruption was non-negotiable from the start of the project.”

Temperature constraints meant that the UPS batteries couldn’t be installed in the data centre’s white space, the area where all the IT equipment is placed. This is because the target operational temperature for the HPC Centre’s data centre was 24°C, whereas batteries are ideally kept at a lower temperature of 20°C.

The existing setup was a single incoming mains supply feeding into an A stream of 160 kVA power to the server racks via uninterruptible power supplies, plus a B stream through 800 kVA of power conditioning units.

The University stipulated an N+N configuration for the proposed equipment upgrade. Both streams would provide 400 kW of UPS-protected power, with at least five minutes runtime at full load to provide adequate protection in the event of any mains failure.

Improving the PUE of the HPC’s critical power infrastructure from 1.52 to below 1.10 was another key project goal.

THE MULTI SENTRY SOLUTION

Jack Ogden reveals: “To meet the University’s key project requirements, we needed a UPS system that combined exceptional performance and availability with the most advanced high-efficiency technology.

“The obvious choice was the latest offering from the Multi Sentry (MST) range manufactured by Riello UPS, who we are an authorised reseller and service partner.

“The Multi Sentry offers unity power factor (kVA = kW) and delivers exceptional operating efficiency of up to 96.5%. It is designed to power capacitive, high-density loads such as blade servers, making it the ideal solution for the HPC Centre.

“An added advantage with the MST is that it has one of the most compact footprints of any UPS in its category. This frees up valuable floor space and means it’s a great choice in environments where room is at a premium.”

The upgrade installed 200 kVA Multi Sentry UPS to replace three existing 80 kVA UPS systems and batteries, plus the two 400 kVA power conditioners.

The UPS batteries were located separately in a dedicated storage room so they could operate at the optimum temperature.

EFFICIENCY AND SPACE SAVINGS

The new Multi Sentry installation saw UPS efficiency throughout the HPC Centre increase from just 66% to 92%. This slashed wasted energy from the previous figure of 82.4 kW to less than 6 kW, a net reduction of more than 76 kW.

Based on the current IT load of 200 kW and standard industry prices, these energy savings add up to £80,000 per year. They reduce the University's CO2 emissions by 185 tonnes too.

And because the new system requires less air conditioning, the total annual energy savings are worth more than £97,000.

Jack Ogden adds: "When the new system reaches its final anticipated load of 400 kW, the annual savings could be as much as £240,000, not to mention 550 tonnes of CO2."

PUE for the critical power infrastructure dropped from the existing 1.52 to 1.04. This is well below the University's initial target of 1.10.

While the compact footprint of the Multi Sentry delivered another welcome benefit too. The upgrade freed up more than 30m² of usable white space in the HPC Centre's data centre. That was enough room for the University to install 12 more server racks.

Commenting on the successful upgrade, **Simon Burbidge, Director of Advanced Computing, IT Services for the University of Bristol**, said: "The installation of the UPS was a large and complicated project, in the challenging environment of a historical building, which was successfully completed on schedule.

"The benefits of the UPS were immediately apparent and resulted in very much improved stability and availability of our service. We will definitely include this in future projects."

PROJECT HIGHLIGHTS

- Increase UPS efficiency from 66% to 92%
- Reduce energy waste from 82.4kW to below 6kW (a net reduction of 76kW)
- Annual UPS operating cost savings of £80,000
- Total annual energy savings of £97,000
- Projected annual energy savings of £240,000
- Cut annual carbon emissions by 185 tonnes
- Projected to cut annual carbon emissions by 550 tonnes
- Reduce critical power infrastructure PUE from 1.52 to 1.04
- Free up more than 30m² of floor space.