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Rittal's Data Centre Infrastructure Lowers SQA's Carbon Footprint

CUSTOMER REFERENCE

IT (Education)

Customer: SQA (The Scottish Qualifications Authority)
Industry: Education
Established: 1997
Headquarters: Glasgow, Scotland

Power consumption and the carbon footprint of data centres is becoming a major issue with wide-ranging environmental, economic, and technical impacts.

It's recognised that many data centres are hugely inefficient, primarily because they rely on outdated cooling systems that consume enormous amounts of electricity. On average, IT cooling equipment accounts for a staggering 43% of the total electricity consumed by data centres.

Furthermore, older data centres are both financially draining and environmentally unsustainable with a higher carbon footprint. Vast amounts of resources are currently being poured into data centres worldwide - from hyperscale data centres to colocation (colo) facilities, and at enterprise-level. The aim is to increase market capacity; it's predicted that Scotland could be a major beneficiary, by becoming Europe's next data centre hub. Among the compelling reasons for this optimism are the country's climate, its existing renewable energy infrastructure, a welcoming economic environment, and a highly skilled workforce.

One organisation getting ahead of the likely surge in demand for data centre infrastructure in the region is the Scottish Qualifications Authority, which recently invested to upgrade its legacy facilities.

We are delighted with the new Rittal equipment. This upgrade will significantly reduce energy consumption, lower the organisations carbon footprint, and improve the reliability and lifespan of our server equipment.

Stephen Sharkey,
Head of IT Delivery Service, SQA

THE PROJECT

The Challenge

- The existing cooling and UPS units in both data centres had become increasingly unreliable, with all units needing replacing
- The new solutions needed to fit within the available space at the site

The Solution

- 35kW in-row DX/FC LCPs with N+1 included
- 40kW modular rack-mounted UPS with N+1 (3 x 20kW modules) and battery rack

The Challenge

The Scottish Qualifications Authority (SQA) is the national accreditation and awarding body for Scotland. Its purpose is to help people fulfil their potential and maintain standards across Scottish education. It is responsible for the development, maintenance and improvement of a framework of qualifications. SQA also sets and maintains standards for many other awarding bodies, and accredited qualifications such as Scottish Vocational Qualifications.

The organisation has two dual (or mirror) data centres, providing it with a complete duplicate of its primary data centre for uninterrupted operations should the primary site develop a fault.

Each data centre has 18/20 racks arranged in a rack suite around a cold aisle containment (CAC) system, along with an uninterruptible power supply (UPS) housed in an adjoining electrical plant room.

The CACs had been cooled by large, wall-mounted downflow units which pumped cold air into the void (plenum) below the raised access floor. This cold air was pulled up into the aisle containment through vented floor tiles and drawn across the racks to cool the servers. Each rack then exhausted the heated air through the back, and the air was then taken back into the downflow units to be cooled again, allowing it to be repeated.

The existing cooling and the UPS units in both data centres had become increasingly unreliable, with all units needing replacing.

SQA was keen to find more efficient solutions that not only improved reliability, but which also helped lower the data centres' energy usage, reduced their carbon footprints, and lowered operational costs.

These new solutions needed to fit within the available space at its sites – and space was at a premium. Plus, the existing aisle configurations of the rack suites had to remain unchanged, and, because both sites were in use all-year round, any upgrades to existing equipment and services needed to be done within a live environment.

Rittal's expert team surveyed both data centres and proposed replacing the existing solutions with modular rack-mounted UPS modules along with in-row liquid cooling package (LCP) solutions, each with N+1 redundancy.

This would both provide the reliability and efficiencies that the client was seeking, while also taking account of the need to improve the amount of available space at each site:

- The modular rack-mounted UPS and battery modules removed the need for separate UPS units and batteries, which were currently sited within the adjoining electrical plant rooms
- Meanwhile the in-row LCP solutions meant that the team could decommission the existing bulky, wall-mounted downflow units, freeing up further space.

The skills of Rittal's service and installation team would ensure that the client avoided additional downtime costs and disruption that are often associated with on-site works, and there would be no requirement for downtime.

SQA Scottish Qualifications Authority

The Solution

Both data centres were supplied with standard Rittal products:

- 35kW in-row DX/FC LCPs with N+1 included
- 40kW modular rack-mounted UPS with N+1 (3 x 20kW modules) and battery rack

Rittal's LCP solution is an intelligent, highly energy efficient system using DX/FC cooling, designed and programmed to make maximum use of free cooling whenever possible, with the built-in flexibility of automatically switching to refrigerant if temperatures rise above an optimum threshold. The DX solution was more suited to the space to site a condenser plant on the roof.

By placing the cooling equipment directly within the rows, as opposed to placing a unit outside of the aisle, Rittal's team was able to eradicate any need to distribute cold air through the large floor void, which improved the system's efficacy and efficiency by a substantial margin.

Combined, these solutions would create the required controlled environment for the IT equipment along with the necessary redundancy, while freeing-up space within the limited footprints.

Three empty racks were removed from the rack suites at each location to make room for the two new in-row coolers and the UPS battery rack. The old UPS units and batteries were taken out of the electrical plant rooms, along with the associated cooling equipment which was used to maintain the optimum 20oC temperature at each location – further lowering operational costs. In addition, Rittal's engineers also installed all the pipework for the free cooling and DX systems (including an intermediate unit to support the cooling unit at the Glasgow site to compensate for its extra-long pipework) and all electrical works.

Like many UK organisations, SQA has adopted hybrid working policies since Covid restrictions eased. The new equipment has built-in remote monitoring capabilities, which supports flexible working practices. Remote monitoring means that the equipment's performance can be monitored in real-time from off-site locations, and any potential issue (or drop-in service) can be picked up and dealt with before a problem occurs.

SQA now has modern, dependable and energy efficient IT systems that provides the organisation with free cooling at its sites.

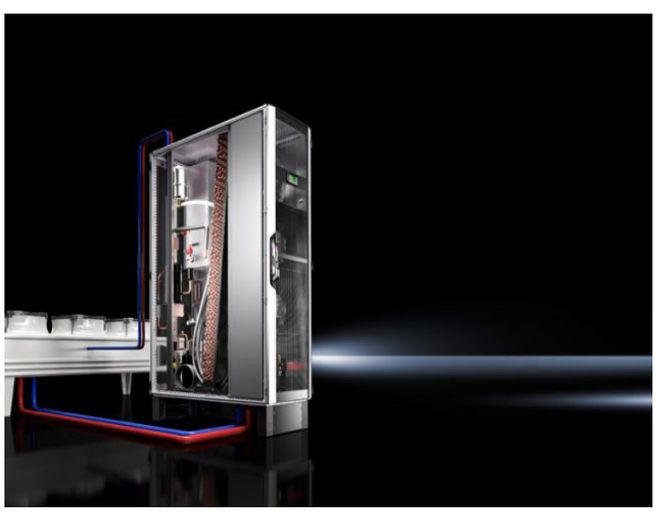
The new technology is supported by a five-year Rittal 360o service and maintenance contract, guaranteeing that it will continue to work to optimum efficiency. Rittal's expert engineers will service the equipment annually and can also offer recommendations in future for upgrades based on the latest technology innovations. In addition, they will be on-hand should there be any issues, with a guaranteed two-hour call-out time if needed.

Stephen Sharkey, Head of IT Service Delivery at the SQA, advises, **"We're delighted with the new Rittal equipment. This upgrade will significantly reduce energy consumption, lower the organisations carbon footprint, and improve the reliability and lifespan of our server equipment".**

These, and other modernisations to our technology infrastructure, are a key part of our whole organisation approach to sustainability. Making these changes are a key part in our continuing efforts to reduce our own carbon emissions by integrating sustainable and low carbon practices throughout our services, products, processes and activities.

"The team at Rittal managed a seamless transition and installation at our sites, meaning we suffered no interruption to our service during the period of works."

IT Cooling - click here



LCP 35kw DX FC - click here

For further details on Rittal Products visit www.rittal.co.uk

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