

Nominee: Sudlows

Nomination title: Stockport Council Data Centre

Project Overview

The Stockport Council data centre facility is a 120 kVA data centre with capacity for 18 Low to medium density IT Cabinets. Cooling to the facility is provided via a highly innovative High Efficiency Direct Air Economiser system with DX top up to allow for compressorless cooling for much of the year while still ensuring that the facility is able to be maintained within ASHRAE guidelines at all times. Dedicated electrical infrastructure provides both UPS protected and conditioned power to the IT cabinets and also allows for planned future upgrades to be undertaken without downtime.

Project Drivers and Key Deliverables

Stockport Council is a large local authority within Greater Manchester, which serves a population of around 300,000 people. The local authority has a strong digital presence with a growing number of services now being delivered via the council's growing IT infrastructure. Like many local authorities, Stockport MBC is also key in the IT strategy of local schools, libraries and other public services within their area.

As with many organisations of this type, the growing IT needs reached a point where it was no longer cost effective or practical to deliver these within the constraints of existing sites. This provided the council with an excellent opportunity to both upgrade the IT facilities and to do this with new, high efficiency technologies which together would allow for a more efficient facility with an increased capacity and reliability over the existing systems.

Sudlows were appointed to design and build the new facility and were able to deliver a bespoke system design incorporating high efficiency technologies aligned with the authority's needs.

Data Centre Specification and Key Technologies

In response to the Council's needs, Sudlows proposed a purpose built, dedicated facility which was to be constructed within previously underutilised space. The building within which the facility was to be housed benefited from large ventilation shafts which were now no-longer utilised so the Sudlows design looked to maximise on this and use these within the scheme to provide an Air economiser solution where ordinarily this would not have been possible. Cooling to the IT systems is therefore provided via a Direct Air Economiser system with DX top-up and Cold Aisle Containment, allowing cabinet densities up to around 7kW to be easily supported.

Electrically, the data centre is provided with a bespoke LV distribution system which provides a level of redundancy and resiliency in-line with the council's needs and budget, providing N+N final

distribution circuits and UPS protection. The phasing of the project allows for the day one solution to include for 1 No. UPS System with future modular expansion to a full N+1 redundancy level. In addition, the system was designed to be upgraded with a dedicated generator system just for the data centre in the future, with no required downtime.

In addition to the core critical electrical and mechanical installations, the facility also benefits from a state-of-the-art dedicated and bespoke BMS system which continually monitors the systems operation for efficiency and alarms. The system incorporates a Liquid detection system and Aspirating Smoke Detection to allow for critical alarming in response to leak or smoke.

Separate from the Aspiration Detection systems, the data suite is also protected with a dedicated low pressure fire suppression system with double knock point detection to automatically respond to any serious fire event, protecting the IT systems housed within the facility.

To maximise efficiency and allow for different spaces to be maintained at different conditions, the data centre is served by a separate LV Switch room which adopts a more traditional cooling topology due to the lower temperatures required for the battery systems; by separating this space we have been able to take advantage of the wider range of operation of the modern IT equipment being deployed.

Innovation

The data centres' primary innovate feature is the use of the existing ventilation shafts to provide the required air for a High efficiency air economiser system. This is combined with a bespoke filtration system, air attemperation system and inverter driven DX top up systems to provide a bespoke cooling system which operates at the top end of industry efficiencies while also not compromising on the environmental conditions within the space.

The innovative air conditioning systems were manufactured by one of the UK's leading CRAC unit manufacturers and as such are the first of their type off the production line to be installed. Each unit uses the latest energy efficient 'i-drive' inverter compressor technology to ensure that they match the capacity of the unit accurately to the available room load. In addition the top inlet fresh air economiser further enhances efficiency by utilising low temperature outside air, mixing with return air to provide an optimum supply air temperature which means that in this mode mechanical cooling is switched off. These features combine to result in excellent energy efficiency for the end user.

In addition to this the whole data centre is monitored extensively with a dedicated BMS system with allows for the operation of the system to be closely monitored and performance measured against expectations; although this in itself is not particularly innovative it allows us to operate the system at the peak of its efficiency at all times and in-line with the actual loads within the space.

Project Challenges

The project was not without challenges but those which were faced were all overcome by the highly experienced and specialised Sudlows Critical Infrastructures delivery team.

One of the primary challenges, which is common to many data centre projects, was “time”. The project was required to be completed within a short timescale but careful and experienced planning allowed Sudlows to deliver the project within the timeframes allowed. Ultimately, a ‘must succeed’ attitude was central to the delivery of the project and this was instilled through all levels of the project team, both within Sudlows and throughout the supply chain. Because of this, Sudlows were able to deliver the project within a timeframe of only 7 Weeks which given the lead times of the larger items of equipment, this was a particularly impressive outcome.

Another challenge which was faced was deliveries of large and heavy equipment such as CRAC units and LV Switchgear. Access to the below ground level where the facility was located was limited and access routes included steep ramps. To allow for the installations of the major items of plant within such tight constraints, a specialist installation team utilised low level mechanical lifting and stabilising equipment to ensure the smooth, and safe, delivery of plant within the space.

Project Benefits and Review

In line with the initial objectives of the project, the delivery of this facility has allowed Stockport Council to start to migrate services from an existing, aging computer room, into a brand new, high efficiency, resilient data centre. The facility is key to the ongoing operations of Stockport Council and their ability to continue to meet the needs of their end users with state-of-the-art Digital Services.

Why nominee should win

- The facility replaces an existing, aging space with a High Efficiency, dedicated data centre, employing the latest technologies to allow for growth to be accommodated while contributing towards overall environmental and efficiency goals.
- Direct Air Economiser Systems have been utilised within the project to maximise efficiency but careful attention has been given to specialised filtration systems to ensure that the conditions within the critical environment are maintained at the highest quality at all times.

- **The project has been delivered within an extremely tight timeframe of only 7 weeks to allow the Council to meet its own deliverables with their IT strategy plans.**
- **Inverter driven compressors have been utilised within all the cooling systems to allow for cooling to match the demand of the systems installed.**
- **The facility is key to the ongoing operations of Stockport Council and their ability to continue to meet the needs of their end users with state-of-the-art Digital Services.**