

EVAPORATIVE COOLING OF THE DATA CENTRE FOR THE WELSH NATIONAL LIBRARY

The Data centre at the Welsh National Library is a lightweight, well insulated construction built within one of the internal quadrangle courtyards at the rear of the Library.

It is currently cooled using 2 no. Denco Computer Room Air Conditioning (CRACs) units, these struggle to keep the area cool due to the high level of heatload within the area generated by the racks.

The solution was the installation of 2 no. EcoCooling side discharge units ducted under the floor at the rear of the area and 2 no. Celsius Wall mounted extraction units extracting the warm air from the rear of the hot aisles.

The Celsius system provides over 60KW of cooling to the area and will save over £10,000.00 annum in running costs and over 123 tonnes of carbon emissions.

The Celsius system is automatically linked into the Denco CRACs to provide full backup. The entering fresh air is tempered in the winter months using the warm air from the hot aisles introduced into the entering fresh air using 2 no. Celsius underfloor 'atemperation' fans.

The installation was undertaken in less than 10 days with no disruption to the operation of the live Data Centre.



Celsius fully installed the system, including all builders work, supporting steelwork, flashings, water pipework, electrical wiring and full commissioning.



Above: Celsius underfloor atemperation fans.
Right: Coolers 'squeezed' into the gap.



Above: Wall extraction fan and controls with dampers.
Right: Detailed view of the controls.

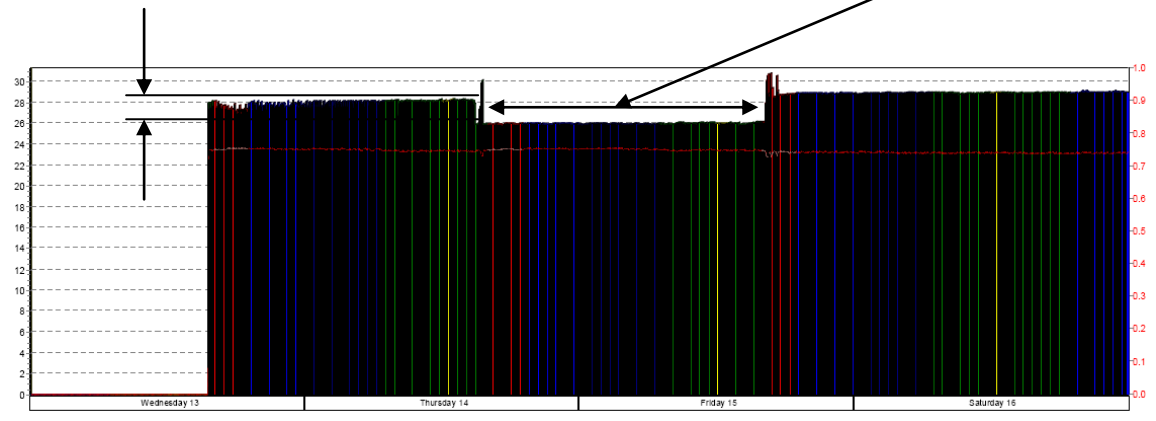
Commissioning Data 7th April 2011

External Temp	14Co.
Entering Temp	9 Co
Room Tem	20Co.

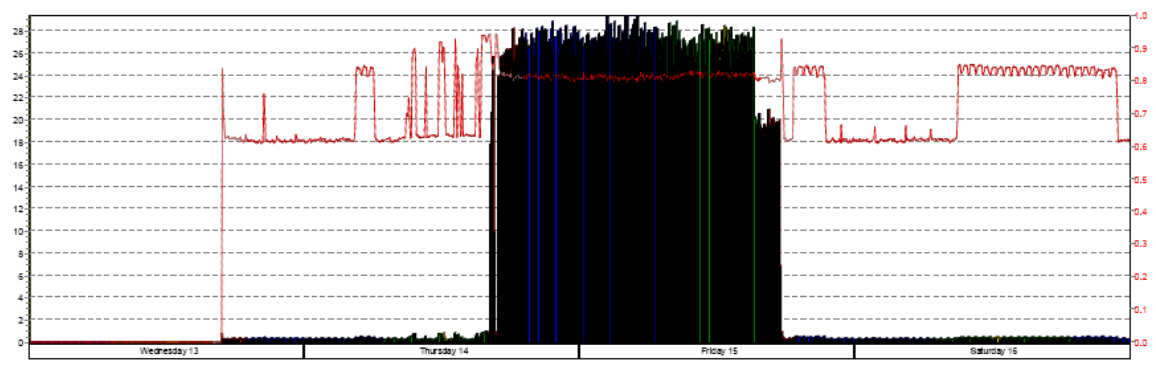
Clear Proof of the System working well

The new Celsius EcoCooling system is powered from the UPS to ensure cooling even during a power outage. The following graphs supplied by the Welsh National Library clearly indicate the power used by both the Celsius system and the existing CRAC units.

Below, this graph illustrates the power draw from the UPS, powering the Data Racks and the Celsius system. The library switched from EcoCooling to the Crac's for a 24 hour period, the consequent reduction in load is clear to see. The racks consume approximately 26KW/hrs and the Celsius EcoCooling system only requires a further 2.2KW.



This graph below shows the load for the existing CRAC units alone during the same period, this being on average 28KW/hrs.



This all means that the Data Room has a PUE when using the CRACs of 2.07, this reduces immediately when the cooling is switched to EcoCooling to a mere 1.08, making it one of the most efficient Data Rooms in the world.