

Maritime monitoring

TEAM helps Merseyside Maritime Museum to save £24,000

Merseyside Maritime Museum is one of the largest of its kind in Europe and has the most extensive collection of grade I listed buildings in England. It opened in 1980 and contains outstanding collections of maritime history including; paintings, models, artefacts and several full-size ships. The collections reflect Liverpool's historical importance as a gateway to the world and attracts around 331,700 visitors a year.

The museum, a software customer of TEAM (EAA Ltd) decided to become involved with the company's consultancy service as part of an advanced metering project. A number of factors encouraged the museum to look at ways in which it could reduce its energy consumption. These included the rapid rise of wholesale gas and electricity prices and the need to meet funding requirements set by the DCMS (the Department for Culture, Media and Sport). In addition the museum's ownership group, National Museums Liverpool, had become committed to an energy and environmental policy, part of which aims to reduce its impact on the environment.



Installing half-hourly meter readers

Like most other museums and galleries, Merseyside Maritime Museum had no provision for 30-minute data readings for its electricity, gas and water consumption. This meant that it was not possible to pinpoint what was causing a noticeable variation in energy use.

Carole Youds, energy and facilities manager for National Museums Liverpool, said: "The site had provisions for collecting internal temperature and humidity but nothing in place for obtaining

detailed profile data for electricity, gas and water, or other factors relating to energy consumption".

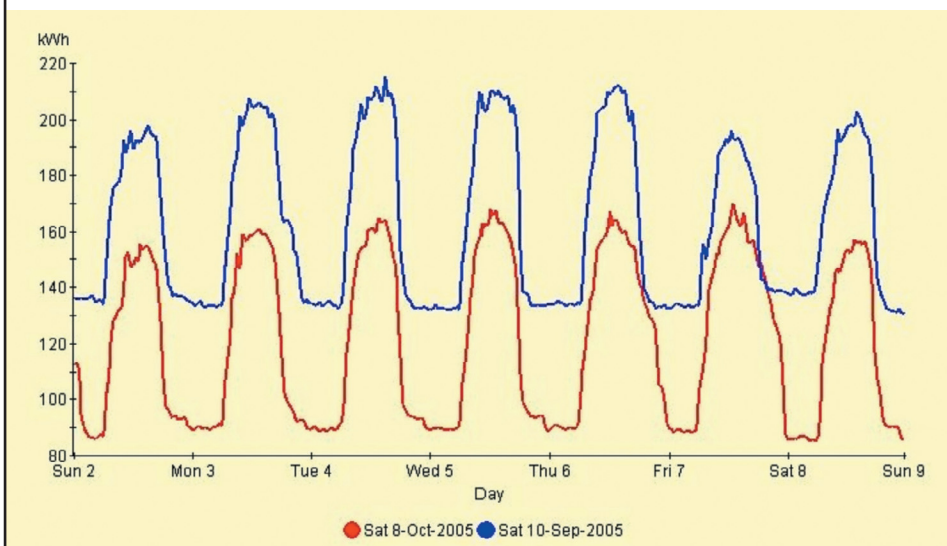
She continued: "We used to receive monthly utility bills and compare them to monthly meter readings from the site maintenance team. As we were not receiving real-time data it was extremely difficult to pinpoint what we should be doing differently. The practical solutions provided by TEAM have therefore been invaluable in helping us to get back on track".

The initial solution involved the utility companies replacing the meters and TEAM installing a new data logging system.

Energy savings identification

TEAM's first challenge was to identify where savings could be made. Through analysing half-hourly data using the TEAM Sigma HF software it highlighted a typical electricity demand of 400kW during the day and a high level of 280kW at night-time. This identified that the chillers, Air Handling Units (AHU's) and heating systems were in operation 24 hours a day, seven days a week in order to maintain a desired temperature level of 24°C and a relative humidity of 50% for preserving the museum's artefacts.

TEAM Consultancy advised on how the museum should operate the



Saving	Realised (7 Months)	Projected (1 Year)	% Saving (7months)
Electricity (kWh)	177,908	274,760	7.0%
Gas (kWh)	457,928	641,100	24.6%
Water (m ³)	840		10.0%
Total	497,518	915,860	
Financial Savings			
Electricity* (£)	£8,895	£13,738	
Gas (£)**	£13,738	£19,233	
Water (m ³)	£1,452		
Total	£24,085	£32,971	
Carbon Savings			
Tonnes of CO ₂ (Electricity)	76.5	118.1	
Tonnes of CO ₂ (Gas)	87.0	121.9	
Total	163.5	240	

*Electricity: 5p/kWh ** Gas: 3p/kWh

three AHU's serving the theatre, entrance foyer and shop. These AHU's were operating continuously but TEAM made the recommendation for time switches to be installed, resulting in an automatic switch off whenever the building was unoccupied.

To investigate how the chiller should operate, additional sub-metering was installed on all three chiller units. It was then recommended that savings could be made by changing the control regime, including relaxing the chiller controls and their set points, while still keeping the building conditions within DCMS guidelines for the museum's artefacts. TEAM recommended relaxing the

humidity settings to a band of 40%-60% instead of 50% (where appropriate). The next step was to install external temperature and humidity sensors to enable analysis of the savings achieved.

The report below, taken from TEAM Sigma HF, illustrates site performance before and after relaxing the control regime. This has resulted in substantial electricity, gas and water savings for National Museums Liverpool.

Speaking of the difference made by TEAM's involvement with the museum Carole said: "TEAM's introduction of a more thorough and efficient way to manage energy has led to significant

savings for National Museums Liverpool, not least because the museum consumes 20% of the total electricity and 13% of the total gas for all of our sites. Our gas consumption has been reduced by a staggering 25% and our electricity consumption by 7% in seven months".

Key achievements

TEAM has helped National Museums Liverpool to make a number of significant savings. Some of the key achievements include:

- Electricity consumption reduced by 7.0% in seven months
- Gas consumption reduced by 24.6% in seven months
- Water consumption reduced by 10% in seven months
- £22,633 of electricity and gas savings achieved in seven months
- Improved heating and cooling efficiency
- The Estate Management Department for National Museums Liverpool has received energy efficiency accreditation from the Carbon Trust for all of their sites

Savings

The total cost of the meter reading system was £7,500 and it has paid for itself within 2-3 months. The table below details some of the savings made.

10449

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