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ABB drives save National Marine Aquarium £15,000 in energy

Nine ABB variable speed drives will be saving the National Marine Aquarium in Plymouth over £15,000 in electricity annually. One 11kW pump alone will save £2,900 per year.

The Aquarium features a 2.5 million litre seawater tank, which, at 10.5 m, is Britain's biggest. Keeping the inhabitants of the tanks healthy involves constant pumping of water at the correct temperature, resulting in a substantial energy bill. John Selwood, Engineering Manager for the facility, says: "We needed to save energy, however we have nine pumps for the tanks that must be on all the time, with varying flow and pressure. "

The constant operation means that reliability and accurate control are vital. Although the Aquarium's pumps were operated by an automatic control system using PLCs, flow and pressure were controlled provided by a manual throttle valve. This resulted in surplus energy as the pumps were running at 100% speed, with only a proportion of its output being used.

Selwood asked electrical contractor Drew & Co to investigate the pumping and heating systems and suggest ways to save energy. Its managing director, Andrew Botterill, says: "Because the pumping system provides essential life support to the fish in the tanks, it was essential that we install reliable control systems. ABB's drives give us the reliability we need. We have used a large number of them with no failures and I have complete faith in the reliability of ABB's technology and products."

Constant operation of the pumps meant that the installation of the drives had to be a hot changeover, with the minimum possible downtime of the pump. This was helped by the interchangeable keypads on the ABB drives. Says Botterill: "We programmed one drive and tested it in the workshop. Then all we had to do was to plug in that drive's keypad to the other drives and upload the parameters. This interchangeability of the keypads was key to installing the drives quickly. We installed each drive in only two hours."

Drew carried out an energy appraisal to determine where most of the energy was being used. Nine ABB variable speed drives were installed, ranging from 7.5 to 18.5 kW. Single drives now control the duty and standby pumps sets, changing automatically to the duty pump as required. Pressure transducers in the pump output provide a feedback signal to the drive, allowing the throttle valves to be kept fully open, allowing the VSD to determine the correct pump speed for the desired flow rate.

Following installation, energy consumption figures were again monitored. "Our initial assessment was that the client would save £14,000 on energy. Three months after the drives were installed we estimated that the aquarium would save even more - £15,600," says Botterill.

The ABB drives were sourced from ABB Drives Alliance partner APDS. "We aim to build a support mechanism for the client and APDS to help with ongoing maintenance," says Botterill.

"We have a good relationship with APDS and now use ABB drives exclusively. They have trained our staff and provide excellent service. We know we can get a drive from them at very short notice, whatever the time of day, so we can always get a drive to our clients in case of an emergency."

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Caption: Nine ABB variable speed drives will be saving the National Marine Aquarium in Plymouth over £15,000 in electricity annually.

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