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Capturing untapped Energy:
Pump as Turbine - Avon Dam

Avon Dam Project

South West Water is part of the Pennon Group plc.

They provide reliable, efficient and high quality drinking water and wastewater service throughout Cornwall and Devon and in small areas of Somerset and Dorset. South West Water came into being in 1989 with the privatisation of the UK water industry. It is their belief that by investing in the future of this region, they are not only improving the quality of life for todays residents and visitors, but are also taking responsibility for future generations.
The Avon Dam energy recovery system is located within Dartmoor near the town of Buckfastleigh, Devon.

KSB, in partnership with Kier (May Gurney) have installed several hydro-electric generating schemes employing Pumps as Turbines (PaT's) for South West Water.

The scheme at Avon Dam consists of two PaT's, one generating from the compensation flow and a larger unit which generates from the spill flow in the winter months or during the periods of high rainfall.

The electrical power yield on the compensation flow is 11 kW, running virtually 24 hours/day, 7 days/week. The power generated from the spill flow is 140kW, running for around 3 months in every year. This results in a generated output of 454,000 kWh per annum.

The Pump as Turbine solution from KSB and Kier captures previously untapped energy. The capital cost and associated payback period benefit was far more attractive than that of any conventional turbine solutions or other alternatives being offered.

The primary factors for choosing KSB Pumps as Turbines were the benefits offered by centrifugal pumps running in reverse as well as the specialist support and guidance provided by KSB Ltd in Loughborough. Compared with conventional hydraulic turbines, the advantages of KSB PaT's are the low investment, service and maintenance costs. Whilst a conventional turbine has to be specially designed and built to meet customer's requirements, PaT's are essentially standard products.

The KSB PaT's chosen for this application are existing, proven and time-tested designs available for installation much more quickly.

In the Avon Dam project the measured hydraulic efficiency of the Spill Turbine is 86.4%, while the Compensation Turbine runs at 78%.

The design of the products coupled with the comprehensive know-how of our experts has ensured that the operating reliability is maximised and down time kept low.

Should you need more information, please do not hesitate to contact:

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Spill flow PaT (coupling guard removed for clarity)

Compensation flow PaT

Scope of supply	Technical Specification
1 x Etabloc MN 100-200 (15kW) 1 x Omega 350-430 (160kW)	Compensation Turbine 60 l/s @ 27 m - generating 96,000 kWh per annum* Spill Turbine 650 l/s @ 27 m - generating 358,400 kWh per annum**
Control system for both PaTs PLC plain module Inc Software	
Application:	* Based on 365 days/annum running
Pump as Turbines (PaT)	** Based on historical spill data (2560 hrs per annum)
	Commissioned: June 2012

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