Capturing untapped Energy:
Pump as Turbine - Watercombe

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 today’s residents and visitors, but are also taking responsibility for future generations. The Watercombe scheme is located within Dartmoor National Park, Devon, near Ivybridge.

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

SWW abstracts water from 2 rivers in the Watercombe area, the Yealm and the Erme. Both flows are combined and delivered into the Spine Main feeding Littlehempston WTW. The River Erme is around 100m higher than the Yealm, so the pressure of that flow has to be reduced, by around 9bar, before it joins with the flow from the Yealm. The PaT at Watercombe replaces a pressure reducing valve, converting the surplus pressure into power, rather than destroying it as noise and heat. The inlet pressure is approx. 15bar and the outlet pressure is approx. 6bar.

The site is in a remote area of the Dartmoor National Park, so minimising noise levels was a key factor. The low noise generated by the KSB PaT (75 dB(A)) allowed a standard building to be used, with standard acoustic enclosures around the PaT and PRV.
The electrical power yield is approx 35kW, running whenever the Erme source is in use.

The Pump as Turbine solution from KSB and Kier captures previously untapped energy. The capital cost and associated payback period 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 low noise levels 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/built to meet customer’s requirements, PaT’s are essentially standard products.

The KSB PaT chosen for this application is an existing, proven and time tested design available for installation much more quickly.

The measured hydraulic efficiency of the PaT at Watercombe is 75%. The design of the products coupled with the comprehensive know-how of our experts also ensures that operating reliability is maximised and downtime kept low.

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

Mark Ellis
KSB Ltd, Loughborough, LE11 5TF
Tel. 01509 220 194
mark.ellis@ksb.com
www.ksb.co.uk

Scope of supply
Technical Specification

1 x Multitec A 125/2-9.1 11.67 (37kW) 55.3 l/s @ 90m variable speed*

Control system for PaT PLC plain module Inc Software

* Anticipated utilisation is 320day per annum (7680hr) will yield 284MWhr/annum

Commissioned: October 2013