

CASE STUDIES

Energy Recovery from existing Water Process & Distribution Systems in Africa

Gilkes have been supplying turbines for use on water treatment works in Africa for over 70 years, and continue to provide bespoke solutions for our clients. Water entering a plant for treatment is passed through a Gilkes Turbine, providing power for either local use or distribution to the grid. Using a Gilkes Turgo Impulse Turbine, flow control is independent of power generation.

All the Cape Town sites below are potable water facilities and are using the power generated for their own plant consumption and are not connected to the Municipality or Eskom Grids.

Steenbrass Filtration Plant, Cape Town, South Africa **KEY STATISTICS**

Customer: S & L

Turbine type: 2 x HCTI Single Jet Turgo's

Total Power Output: 358 kW

Runner Diameter: 21"

Net Head: 34 m

Flow: 656 l/s

Speed: 428 rpm

Installed: 1942

Scope of Supply: 2 Gilkes Single Jet Turgo Turbines, Governor, Generator, Flywheel.

The Lower Steenbrass Dam supplies the Water Treatment Works (WTW) through an 810mm steel pipe transferring a maximum of 150MI/day. Before the water enters the works it enters the New Screening chamber where the water is split and 115 MI/day is fed to two existing Turgo turbines of capacity 179 kW. Only one turbine functions at a time taking a flow of 57.5 MI/day and the rest is bypassed. The remaining 35 MI/day is bypassed through the old screening chamber where it then enters the works.



Blackheath WTW, Cape Town, South Africa **KEY STATISTICS**

Customer: APE Africa (Pty) Ltd

Turbine type: HCTI Single Jet Turgo

Power Output: 711 kW

Runner Diameter: 38"

Net Head: 56 m

Flow: 1520 l/s

Speed: 350 rpm

Installed: 1981

Scope of Supply: Gilkes SJ Turgo, Woodward Governor UGI with Pumping unit. (600frlbs), SRHS 380 (Special) speed increaser gearbox, Generator, Flywheel on rear of generator.

The Blackheath Water Treatment Plant is supplied by Stellenboschberg outlet with raw water by the means of a 17.8km long 1.5m diameter prestressed concrete gravity pipeline with a design capacity of 400 ml/day.

Within the treatment plant is a 711kW Turgo Turbine which generates enough electricity to power the plant using 1520/l/s



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CASE STUDIES cont.....

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Faure WTW, Cape Town, South Africa **KEY STATISTICS**

Customer: Biwater Ltd
Turbine type: HCTI Twin Jet Turgo
Power Output: 1475 kW
Runner Diameter: 31"
Net Head: 130 m

Flow: 1458 l/s
Speed: 500 rpm
Installed: 1992

Scope of Supply: Gilkes Twin Jet Turgo Turbine, Woodward Governor, Lube Oil System, Generator, Hydraulic Control Module.

The Gilkes turbine is installed on the Raw Water Pipeline entering the plant from the DWA water supply from the Theewaterskloof Dam. The 1675mm pipeline has a static head of 142m and sees draws of up to 620MI/day max. Typical flows are between 100 and 500 MI/day. The turbine is rated at 1475 kW and produces enough electricity for the running of the plant. The remaining raw water is bypassed into the WTW.



SiBo Sanitation Works, Lake Victoria, Kenya **KEY STATISTICS**

Customer: SiBo Water & Sanitation Company
Turbine type: 5 x Series C Francis Turbines connected to multi-stage pumps
Total Power Output: 360 kW
Runner Diameter: 7.5"
Net Head: 27 m

Flow: 400 l/s
Speed: 1650 rpm
Installed: 2016

Scope of Supply: 5 x Series C Francis Turbines with 5 multi stage pumps connected to turbines situated on base plates. 2 further pumps connected to motors. Starter panel for pump and motor. Various pipe and gate valves.

Siaya & Bondo Water Sanitation Company Ltd required a water turbine & pump solution that would deliver clean water to their local population utilising the energy available within the existing local river. SiBo WTW is an upgrade and expansion to the existing clean water supply for the area.

The Series C Francis turbines were the chosen solution by Gilkes because of their proven design and operation at relatively low head.



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