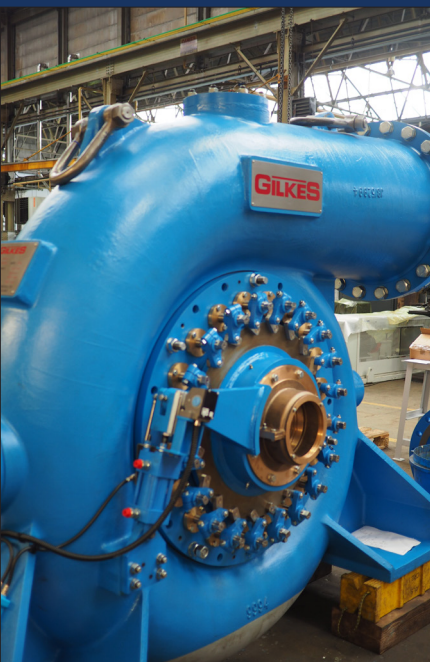


CASE STUDY

LOCHY, Inverloch, Dalmally, Scotland



KEY STATISTICS (Turbine 1)

Turbine type: G110 Francis
Number of Turbines: 1
Power (kW): 1376 kW
Net Head: 122m
Flow: 1269 l/s
Runner Dia: 475 mm
Speed: 1000 rpm

KEY STATISTICS (Turbine 2)

Turbine type: G130 Francis
Number of Turbines: 1
Power (kW): 624 kW
Net Head: 122m
Flow: 653 l/s
Runner Dia: 325 mm
Speed: 1500 rpm

SCOPE OF SUPPLY

2 x Gilkes Francis Turbines
Hydraulic actuation of the guide vanes
2 x Main inlet valve (Hydraulic weight to close butterfly valve)
100rpm & 15rpm Synchronous Generators
Twin turbine PLC control & switchgear panel.
Head level sensor.
Main step up transformer
Installation and commissioning.
Service & maintenance contract.

The Lochy project is a classic medium-head, high-flow design incorporating a large single intake, large-bore pipeline and two dissimilar Gilkes Francis turbines installed in a new purpose built powerhouse.

Gilkes first became involved in the project in 2010, following Gilkes Energy's intention to develop the scheme on the National Forest Estate which is managed by Forestry Commission Scotland. Gilkes engineers looked at various turbine configurations, including similar and dissimilar turbines with the usual intention of maximising generation from the scheme over the course of each year.

Following flow duration analysis two dissimilar Gilkes Francis machines were ultimately selected. T1 a 1000rpm 1376kW Francis and T2 a 1500rpm 624kW Francis proved to be the most efficient arrangement based on the available abstraction from the River Lochy. When correctly applied, a dissimilar arrangement of Francis turbines allows the units to work together during times of high flow and completely independently during times of lower flows. This allows greater up time while operating at or close to their design flow rate. The Lochy machines will run close to their maximum efficiencies of over 91% for a substantial proportion of the time. Ultimately meaning less water is wasted operating at above or below its point of best efficiency.

The turbines are fed by a 3.4km GRP pipeline which provides a Gross head of 126m and a flow rate of up to 2,100l/sec. The Powerhouse has been designed to accept a third turbine should this become a viable option in the future.

The Lochy scheme started generating in July 2016 and was delivered on time and on budget.

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