



Tekapo Hydro Power Plant

More than a flow meter - optimize the operation of the plant!

Scope of service

- RISONIC *modular*
- Flow Measurement
 - Overvelocity protection
 - Sediment monitoring
 - Efficiency monitoring
- Installation
- Commissioning

Customer

Genesis Energy Ltd
Hydro Plants Generation Company
Hamilton, New Zealand

Commissioning

October 2020 – January 2021

Technical data

- 2 Power stations Tekapo A (TKA) and Tekapo B (TKB)
- TKA 1x turbine (Kaplan) and generating capacity of 31.5 MW
- TKB 2x turbines / generating capacity of 80 MW each

Plant description

The Tekapo Power Scheme is located at the head of the Waitaki Valley in the Mackenzie District, New Zealand and uses water from the glacial-fed Lake Tekapo to generate electricity through two power stations (Tekapo A and Tekapo B). Both power stations are owned and operated by Genesis Energy. Tekapo A Power Station generates electricity from water diverted from Lake Tekapo via a 1.4km tunnel with surge chamber. The water outflow from Tekapo A then passes down a 25.5km canal and generates electricity through Tekapo B Power Station, located on the shores of Lake Pukaki.

Tekapo Hydro Power Plant

PROJECT SCOPE

The project scope included the following flow meter components and services by Rittmeyer in cooperation with the local Rittmeyer distributor Hydro and General Engineering Ltd (HAGEL), Genesis Energy Ltd and various subcontractors.

- Tekapo A intake flow meter (2-path system)
- Tekapo A downstream flow meter (8-path system according to IEC60041)
- Tekapo B downstream flow meter (8-path system according to IEC60041)
- Supervision of the IEC60041 laser based sensor positioning
- Transducer installation
- Commissioning of the flow meter
- Programming of efficiency measurement and sediment monitoring applications

«THE TEAM PERFORMED EXCEPTIONALLY WELL WORKING TOGETHER TO DELIVER THE COMPLEX INSTALLATION WITHIN THE TIGHT TIMEFRAME OF THE OUTAGES.»

WHY GENESIS ENERGY SELECTED RITTMAYER FLOW METER

Rittmeyer flow meters were selected, as they have a great track record, high accuracy, excellent local support/distributor and added functionality like Sediment monitoring, Efficiency monitoring, Penstock Leak Detection system etc.

The Tekapo A and B penstock flow meters were installed to get better control over the water consumption of both power plants. The current flow equations at Tekapo A and Tekapo B used to control the system, overestimate the flow, especially at high MW values and high lake levels by about 5-8 m³/s. This difference, confirmed with the new flow meters, provides Genesis with the ability to direct additional flow through the



system when power prices are high. The MW gains apply to both Tekapo A and Tekapo B and therefore can be large during peak periods when prices are high.

FURTHER ADDED VALUE FOR GENESIS FROM RITTMAYER FLOW METER

- Enables accurate efficiency calculations for new runners.
- Enables accurate testing and optimisation.
- Compliance with resource consent is immediately correct and not calculated.
- Determine the leakage from the canal accurately.
- Turbidity and sediment data can be realized, This can prevent sludge from being drawn in at the intake and is of interest to the environmental team.
- The pre-configured application «Penstock Leak Detection» can be easily implemented at a later stage.
- Online efficiency monitoring gives an approximation of running efficiency and leading to better utilisation of water, etc.



«THE RETURN ON INVESTMENT IS EXPECTED TO BE 3-5 YEARS BUT WITH A FLOOD EVENT AND THE ABILITY TO PUT AN EXTRA 5M³/S THROUGH THE SCHEME DUE TO THE ACCURACY OF THE FLOWMETERS, THE RETURN ON INVESTMENT WOULD IMPROVE EVEN FURTHER.»

Andrew MacLennan, Electrical Engineer
Genesis Energy Ltd