

# Krafla Geothermal Power Station, Iceland

State-of-the-art controls and electricals for high availability and grid support



## The Plant

The Krafla Power Station is a geothermal power plant operated by Landsvirkjun. Located in the northeast of Iceland, the Power Station was built in the crater of the Krafla volcano. It was first brought online in 1978. Due to need of modernization, the plant was refurbished, and a 2nd unit was installed in 1997.

Geothermal energy is generated with hot water stemming from underground reservoirs, which makes this process extremely environmentally friendly.

Generating 500 Gwh/y and with an installed capacity of 60 MW, Krafla Power Station is crucial for Iceland's energy supply.



**500** GWh/y  
Geothermal Power Output

## The Task

Landsvirkjun chose to modernize the electrical equipment and turbine control system to make the power station state-of-the-art.

To optimize the power output, the turbine control system needed be upgraded and a voltage regulator was required to secure critical electrical components.

Landsvirkjun was looking for a partner to provide long-term support and serviceability during the plant life cycle.

## The Solution

Siemens Energy refurbished and integrated several elements, such as the Omnivise T3000 control system, including turbine governor, hydraulics, monitoring, and instrumentation, as well as generator electrical equipment.

In order to better adjust the grid connection, the turbine control system for the existing pair of MHI DEH turbines was updated. Additionally, a compact voltage regulator with an integrated power module, along with new protection devices, were installed to secure critical electrical components.

Even though all the initially-scoped enhancements were made, the project was not finished. Once Landsvirkjun realized the potential benefits offered by new hydraulics and advanced control algorithms, the improvement ideas began to flow, and the project scope expanded over time. One of the project's main achievements was to enable the Krafla plant to provide primary frequency control.

With these impressive changes, Krafla power station now contributes to grid stability in Iceland and performs more efficiently. Therefore, it is considered one of the best turbines currently in operation in the country.

Landsvirkjun was impressed with Siemens Energy's project implementation, especially the collaboration with the on-site team and the know-how that was freely shared. Despite logistical challenges posed by the Covid-19 pandemic, Siemens Energy delivered smooth and on-time project execution.

## The Result

Modernization of Krafla Power Station provided:

- State-of-the-art operation, control technology, and electrical equipment
- Primary frequency control capability and contribution to grid stability in Iceland
- Improvement of control accuracy
- Smooth implementation process, with nearly no outage time

Published by and copyright © 2023  
Siemens Energy Global GmbH & Co. KG  
Gas Services  
Siemenspromenade 9  
91058 Erlangen, Germany

For the U.S. published by  
Siemens Energy, Inc.  
Gas Services  
4400 N Alafaya Trail  
Orlando, FL 32826, USA



Krafla geothermal power station is located in the crater of the Krafla volcano in Iceland.

**“Our new Omnivise T3000 control system and several other measures allow us to now stabilize the grid with primary frequency control. This places us light years ahead of where we were.”**

Jón Arnar Emilsson, Project Manager, Landsvirkjun

Siemens Energy is a trademark licensed by Siemens AG.

Subject to changes and errors. The information given in this document only contains general descriptions and/or performance features which may not always specifically reflect those described, or which may undergo modification in the course of further development of the products. The requested performance features are binding only when they are expressly agreed upon in the concluded contract. All product designations may be trademarks or product names of Siemens Energy Global GmbH & Co. KG or other companies whose use by third parties for their own purposes could violate the rights of the owners.