

RESTORING RENEWABLE ENERGY

ANDRITZ has successfully commissioned the electro- and hydro-mechanical equipment of the upgraded and modernized Mwadingusha hydropower plant. Located in Tanganyika province (formerly Upper Katanga), the plant is a three-hour drive from Lubumbashi, the country's mining capital.

Democratic Republic of Congo – Since early 2021 and within the framework of a public-private partnership, ANDRITZ together with Société Nationale d'Electricité (SNEL), the Sino-Canadian mining group Ivanhoe, and the international consulting company Stucky have been successfully putting Mwadingusha back online.

Originally commissioned in 1930, the original equipment supplier was Swiss company Charmilles, now

part of ANDRITZ. With no major overhaul for many years, a full rehabilitation and upgrade was needed.

In 2016, ANDRITZ received a contract for the full rehabilitation and modernization of all six 11.8 MW Francis generating units, three brand-new penstocks, intake valves on the upper dam, as well as ancillary hydro-mechanical equipment such as trash rack, stop logs, safety equipment, and valves. For more on this project, see Hydro News No. 31.

CONGO DRC – RICH IN NATURAL RESOURCES

The Democratic Republic of Congo (Congo DRC) has the largest hydropower potential in Africa and one of the largest worldwide. With a technically feasible potential of some 100,000 MW, only about 2.5% of this potential has been developed so far. The new framework for liberalization of the electricity sector could contribute to government plans to increase electricity access rate of the population in the coming years, with upcoming projects such as Inga 3/Grand Inga exceeding an installed capacity of about 11,000 MW.

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TECHNICAL DETAILS

Mwadingusha:

Total output: 78 MW

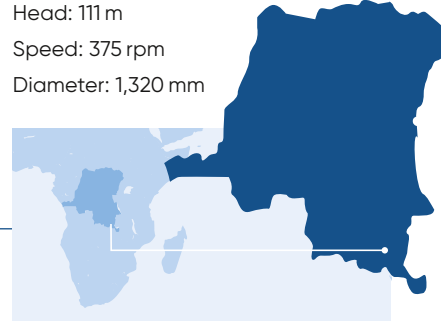
Scope: 6 × 13.05 MW

Voltage: 6.6 kV

Head: 111 m

Speed: 375 rpm

Diameter: 1,320 mm



The contract award followed the successful completion of Koni, a hydropower plant in a cascade just downstream of Mwadingusha at the mouth of Lake Tshangalele, about 250 km northeast of the Kamoa Mine site.

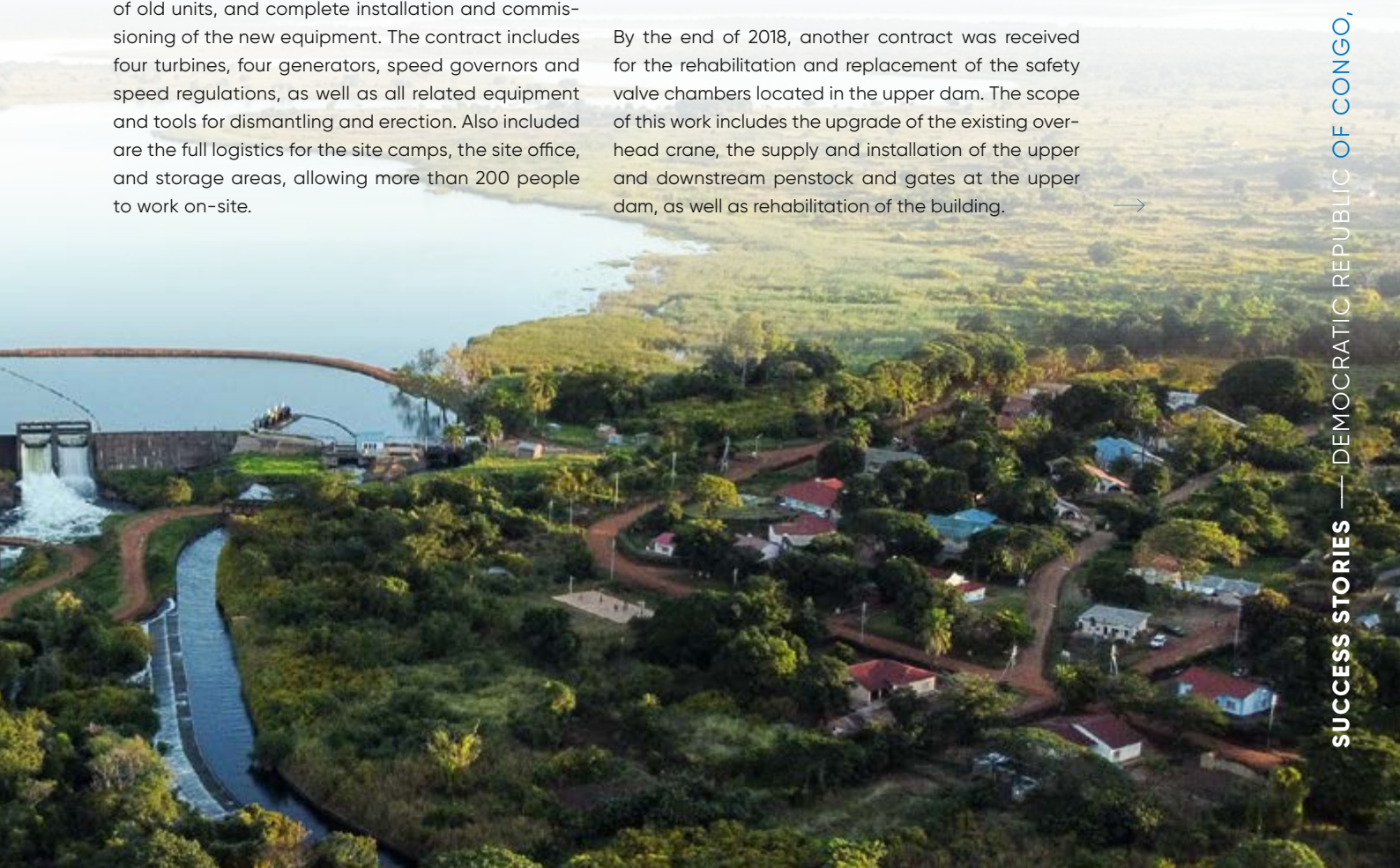
"Once completed, the full upgrade and modernization project is pushing the installed capacity of Mwadingusha to about 78 MW."

Scope of supply for Mwadingusha comprised engineering, manufacturing, delivery, and dismantling of old units, and complete installation and commissioning of the new equipment. The contract includes four turbines, four generators, speed governors and speed regulations, as well as all related equipment and tools for dismantling and erection. Also included are the full logistics for the site camps, the site office, and storage areas, allowing more than 200 people to work on-site.

In May 2017, following engineering optimization of the four original units, an additional order was awarded to ANDRITZ for the two remaining generating units.

In parallel with rehabilitation of other parts of the Mwadingusha complex such as roads, access bridges, and civil works by Stucky, SNEL, and Ivanhoe, in December 2017, ANDRITZ was awarded a further contract for hydro-mechanical works. This contract covers the supply of three new butterfly valves, a manifold of the penstock, trash racks, motorization of the spillway, as well as replacement of the intake valves, safety valves, and stop logs.

By the end of 2018, another contract was received for the rehabilitation and replacement of the safety valve chambers located in the upper dam. The scope of this work includes the upgrade of the existing overhead crane, the supply and installation of the upper and downstream penstock and gates at the upper dam, as well as rehabilitation of the building.





The rehabilitation and modernization will see each unit at Mwadingusha increase output from 11.8 MW to 13.05 MW. The energy will benefit the people of the DRC as well as the Kamo-a-Kakula copper mine.



→ ANDRITZ was also awarded a contract to replace the three horizontal penstocks and gates located between the upper dam and the powerhouse with a very challenging schedule. The scope of works includes a new camp for a staff of 30, site logistics facilities such as a 150-tonne crane, scaffolding, chariots for working inside the penstocks, and anti-corrosion protection.

An unexpected challenge was the global COVID pandemic and the interruption of activity between March and July 2020. With the combined efforts of all parties, most of the staff on-site could be demobilized

and remobilized once work resumed, although coordination of inland and air travel plans was difficult due to ANDRITZ workers coming from different locations in Europe, India, and the Philippines. Even after remobilization, preventive measures were implemented to protect the on-site personnel against any possible infection. Despite this, the three penstocks of Mwadingusha have been in operation since November 2020. All six generating units were progressively put back on the grid until full simultaneous synchronization in September 2021. The industrial sector in the Democratic Republic of Congo has acknowledged an "outstanding technical and human success" during the National Energy Conference held in Lubumbashi on September 17, 2021.

The rehabilitation and modernization will see each unit at Mwadingusha increase output from 11.8 MW to 13.05 MW. The energy will be distributed by SNEL to serve the needs of the people of the DRC as well as Kamo-a-Kakula, the world's largest undeveloped high-grade copper mine, which is operated by Ivanhoe.

The Mwadingusha project is a success story for the highly skilled service and rehabilitation teams from ANDRITZ in Switzerland and Austria, in combination with the excellent manufacturing competence of our ANDRITZ workshops. Completion of the project is also a sign of our customers' trust, and our technological expertise in electro- and hydro-mechanical solutions.



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