

RENOVATE AND REJUVENATE

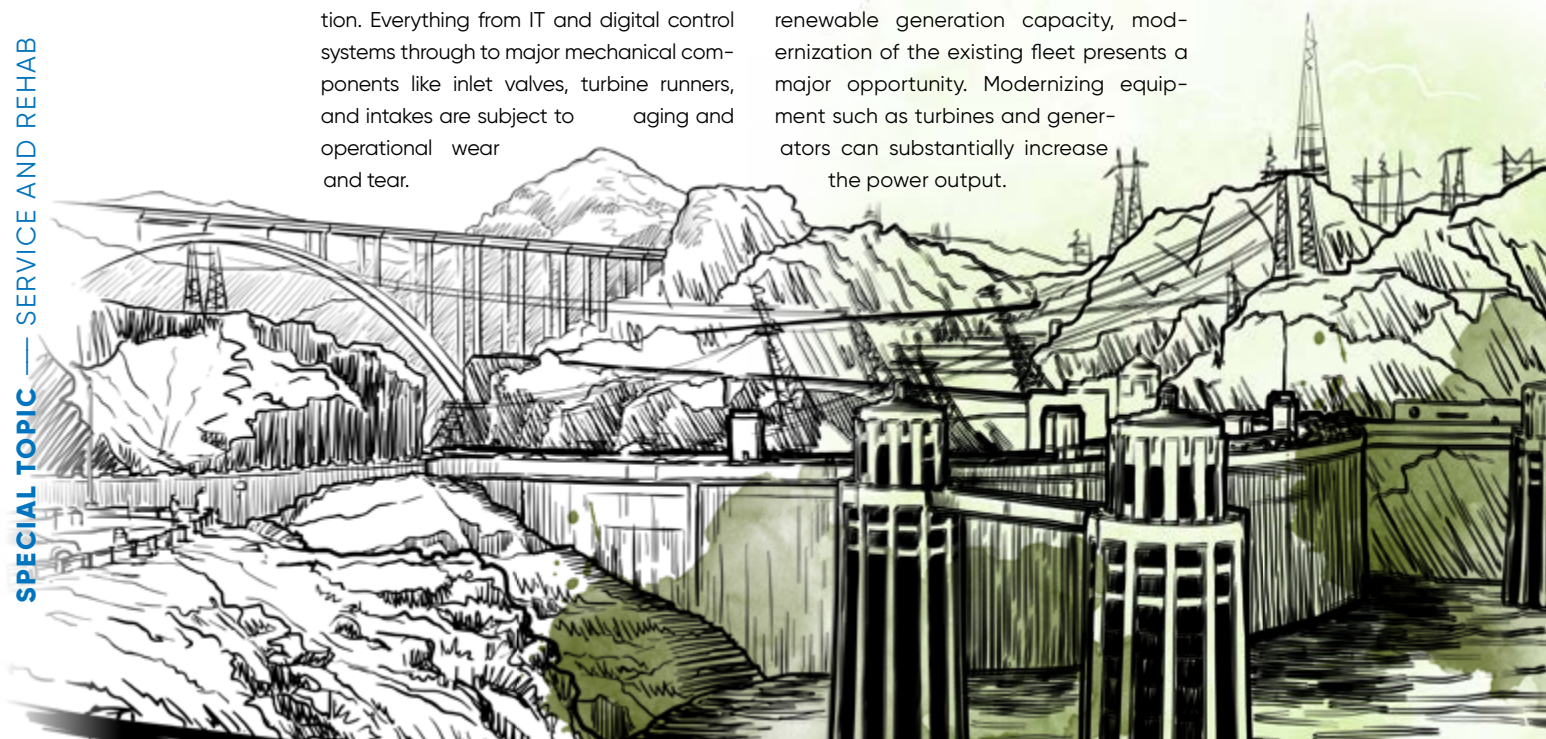
Live long and prosper with ANDRITZ

Among the biggest advantages of hydropower is its renowned longevity. Thousands of hydroelectric facilities are still operating more than a century after they were commissioned resulting in high demand for modernization and upgrades.

Today many of the world's power plants are already decades old. Indeed, according to a recent report from the International Energy Agency, the average age of a hydropower plant in North America is nearly 50 years. And, although civil structures like dams and embankments could easily stand for more than 100 years, the electromechanical equipment has a typical operational life-span of far less given factors like abrasion and corrosion. To get the best out of these long-lived clean power generating systems therefore means a strong commitment to servicing and, when necessary, refurbishment and rehabilitation. Everything from IT and digital control systems through to major mechanical components like inlet valves, turbine runners, and intakes are subject to aging and operational wear and tear.

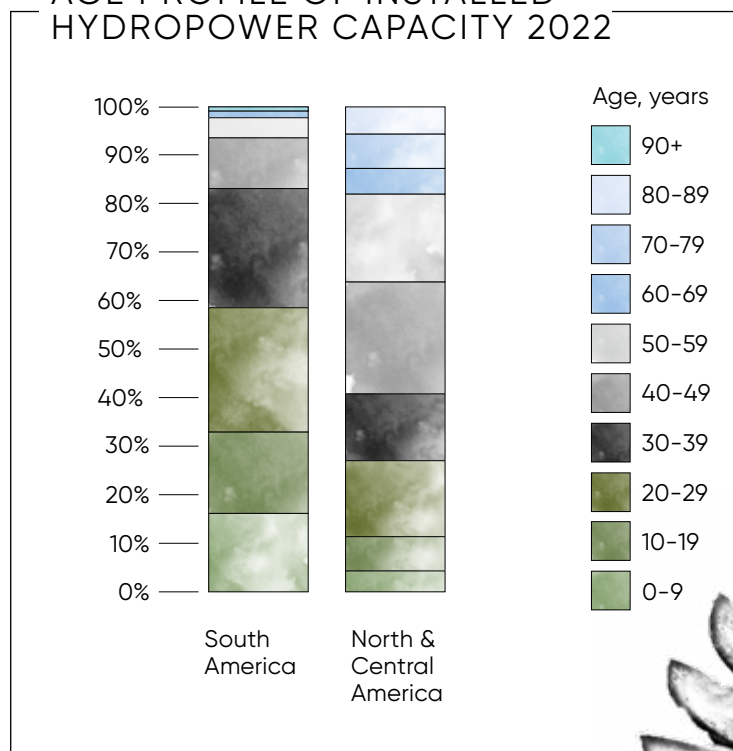
The demand for modernization and upgrading of these assets is rapidly growing given the advancing age of the global fleet. In addition, though, changes to operational requirements in response to the evolving demand for flexible generation are also increasing the need for improvement. Hydropower is well suited to match fluctuations in other renewables like wind and solar by operating as spinning-reserve or fast response capacity. This places new operational demands on these assets though.

Furthermore, given the need to increase renewable generation capacity, modernization of the existing fleet presents a major opportunity. Modernizing equipment such as turbines and generators can substantially increase the power output.



"Modernizing existing hydropower plants boosts performance and yields benefits for owners and the regions they serve."

AGE PROFILE OF INSTALLED HYDROPOWER CAPACITY 2022



Source: Hydropower.org

Turbine and generator efficiency have seen dramatic improvements over the years so that upgrading a 40-year-old turbine runner could add 5% or more to the headline efficiency figure. New demands like reducing the environmental impact of hydropower plants are another opportunity. Solutions like fish-friendly turbine technology and oil-free turbine runner hubs represent a new era of environmental stewardship that is possible through modernization of existing installations.

the turbines of the 1,050 MW Sobradinho hydropower station and has recently signed a contract for a comprehensive refurbishment of the generating units of the 424 MW Jaguará hydropower plant. A current highlight is in Mexico, where ANDRITZ is leading a consortium refurbishing nine hydropower plants with a combined capacity of more than 4,250 MW. The modernization of these plants will boost generation capacity by 243 MW and increase annual generation by some 1,754 GWh.

As a leading supplier and partner to the hydropower industry, ANDRITZ has an extensive catalog of impressive project references across North, South, and Central America. Last year, for instance, ANDRITZ Hydro Canada signed a contract for the refurbishment of four generating units at the Otter Rapids station. Across the border in the USA, ANDRITZ has refurbished some 70 units representing about 54% of the national fleet. These projects include, for example, modernizing the turbine generator units at Old Hickory hydropower plant and the automation modernization of the pumped storage plant John W. Keys III, part of the Grand Coulee hydropower complex.

In South America, ANDRITZ is executing the general overhaul and digitalization of

Modernization can update the performance of old assets through new technologies that will make these assets more efficient and profitable for their owners. An increased level of automation and monitoring will result in better asset management, consequently reducing maintenance costs and downtime. The modernized assets can operate for another 30 years, bringing benefits to their owners and to the regions where these plants are installed.

With services ranging from operation, maintenance and repairs, digitalization, control and automation right through to full refurbishment of complete electro-mechanical systems, whatever the future holds for even the oldest hydropower plants, ANDRITZ has the solution.

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