CUTTING EDGE MANUFACTURING CAPABILITIES

Striving for operational excellence

ANDRITZ relies on the highest manufacturing standards to ensure that all our solutions are optimized to meet exacting customer requirements, protect the environment, and support operational management. This is achieved through robust compliance across all the various process steps in the value chain: planning and design, manufacturing of key components, in-house assembly, shipping, on-site assembly, service support.

ANDRITZ Hydropower operates at seven manufacturing locations across the Americas and our teams collectively perform nearly 500,000 direct labor hours annually. At all these workshops, the hydropower business area delivers high quality components, products, and services, utilizing the experience and expertise of our top qualified employees.

In addition, all these sites are focused on further improvements with the goal of achieving operational excellence supported by an ANDRITZ Production System (APS). This is a system designed to define, describe, quantify, and increase the performance levels of production organizations, as well as generate a common understanding of manufacturing principles and methods. A business-specific handbook is available, while training of employees is continuous, ensuring the competitiveness of each of the manufacturing and service locations by increasing their productivity and performance.

CANADA

Peterborough provides manufacturing services for the supply of new generator stator windings, either bar or coil windings, and their connections. These elements are defined as core components within ANDRITZ and account for about 70,000 working hours per year. The production line comprises up to 15 workstations, including electrical testing to guarantee high quality products.

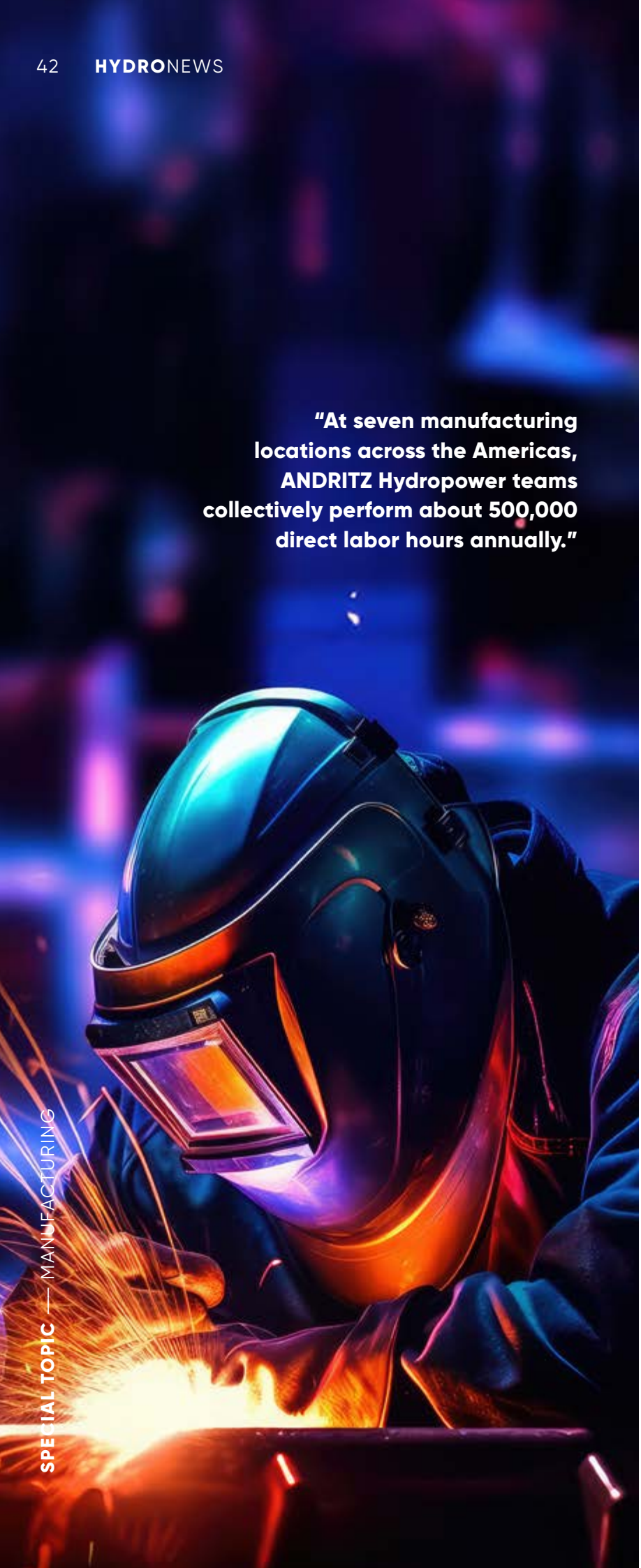
Paris provides manufacturing services for the supply of different types of gates as well as intake trash racks and associated embedded components and hoists. It's a

complete solution provider, including mainly welding, with some machining capacity to ensure exacting tolerances for critical component dimensions. Additionally, blasting, painting and equipment assembly are key functions at this site. The location provides services mainly for Ontario Power Generation, one of the largest electricity generators in North America.

Chambly provides manufacturing services for the supply of new electrical cabinets, for various automation and electrical power system products, such as excitors, governors, protection and control panels, and junction boxes. It is primarily an assembly and testing shop using components and parts supplied by third parties. This process requires substantially more ability than may be apparent at first sight because each cabinet is custom designed and produced.

UNITED STATES

Spokane provides manufacturing services related to the refurbishment and modernization of turbine and generator components. It is primarily a machining →



"At seven manufacturing locations across the Americas, ANDRITZ Hydropower teams collectively perform about 500,000 direct labor hours annually."

shop with some welding capacity for the repair of these components when required. It also performs disassembly and reassembly of turbine and generator systems. Its goal is to refurbish these components as quickly as possible without compromising on safety and quality.

Recently, the Spokane manufacturing facility was involved in the success of major projects in the US such as those at Hoover Dam, Fort Loudoun, and Taum Sauk.

MEXICO

Our Mexican hydro workshop is located in Morelia. A key highlight of this location is its more than 40 years in the market and constant evolution of the product portfolio over that period. At this location mechanical components of up to almost 100 tonnes can be produced. Currently the workshop is operating at its maximum capacity of 250,000 labor hours annually, especially because of a series of hydropower plant rehabilitation projects for the customer CFE (Federal Electricity Commission). In close cooperation with other ANDRITZ units the location is acting as an inter-company manufacturing partner for turbine runners, as well as other heavy-duty components.

BRAZIL

The Araraquara site was acquired in 2018 and has been continuously developed since then. This location acts mainly in brownfield projects and focuses on core component production (turbine runners, generator poles and windings – press cured technology) as well as heavy-duty steel components and synchronous condensers. Since the acquisition, this workshop location has ramped up from 60,000 to 180,000 labor hours of operations annually. Based on the available space, the location could be further utilized. In addition, part of the ANDRITZ Hydropower Brazil workshop is currently rented out to

a third party – so there is still space for further growth if required in the future.

The electrical workshop is dedicated to the manufacturing of active generator components. They run a production line for stator windings of up to 21 kV, starting with the production of green bars and the application of MicaTec R insulation by automated machines. In addition, a pole production line is in operation. To ensure that quality requirements are invariably met, a full quality control laboratory is deployed on site, ranging from controlling resins and other inputs to short and long-term electrical testing.

Specialized in the manufacturing and refurbishment of hydraulic turbines, the Araraquara mechanical workshop is dedicated to the manufacturing of large and heavy components and contains areas for steel fabrication, assembly/disassembly, blasting, painting, and heavy machining, as well as ovens for heat treatment, and compatible cranes. In addition, there is a complete quality control laboratory, including linear measurement platform, an interferometric laser, and other testing and analysis equipment.

CHILE

The Metaliza company located in Colina was acquired by ANDRITZ in 2016 and is the base for our hydro workshop in Chile. With around 25,000 working hours per year, Colina acts as a service location, which delivers component repair, ranging from welding and machining through to HVOF coating. In synergy with our global locations, ANDRITZ Chile continuously invests in the training and development of its personnel. Highlights include internships at workshops in Ravensburg, Germany, training and certification of welders in Mexico, and ongoing training in non-destructive testing techniques.

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Araraquara, Brazil – Synchronous condenser stator for Tucuma project

Morelia, Mexico – Francis runner for Infiernillo hydropower plant

Peterborough, Canada – Coil spreading process for Carillon hydropower project