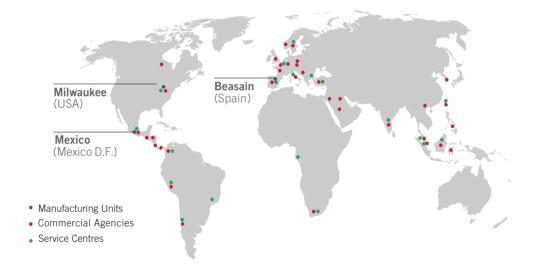
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Your driving force

Indar Electric, S.L.

www.indar.net



REHABILITATION AND REPOWERING OF HYDROELECTRIC GENERATORS



REHABILITATION AND REPOWERING OF HYDROELECTRIC **GENERATORS**

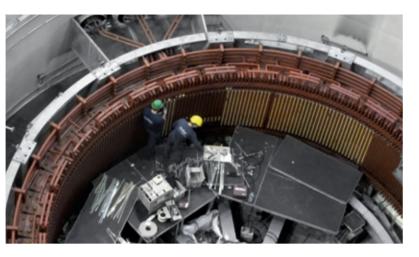


INDAR has over 80 years' experience in the manufacturing of hydroelectric power generation equipment.

The knowledge acquired over this period of time is made available to our clients for the maximum optimization of their installations.

To this end, we provide solutions that are specifica-Ily studied for each particular case and we offer maximum **flexibility** so that the best solution may meet the client's requirements. The provision of top level technology, together with effective project management, ensures a high degree of satisfaction for all our clients whose downtimes are minimized by our excellent execution periods.





Rehabilitations up to 200 MVA

Reliability, availability, performance, productivity and life expectancy

ces have placed it at the edge of the installed Power on the 5 Continents. technological ladder when it comes to The most important electrical compatackling the demanding power genera- nies in the world, IPPs, engineering tion sector. Its advanced laboratory firms, EPCs, manufacturers of with an electrical rotating machine, the turbines and consultants place their most powerful and best equipped trust in Indar for its capacity to adapt R+D+i test bench in Southern Europe, to specific requirements of the its powerful design equipment, its projects in which they participate and installations in Milwaukee (USA) and for being a reflection of the essence of Beasain (Spain) as well as a clear focus maximum efficiency, product robusttowards tailor-made projects, make ness and flexibility in design. Indar the best choice in the market.

INDAR's HYDRO unit is one of the most active in the word's hydroelectric

INDAR's technical and human resour- market today with over 7.5 GW

Direct Technical

Support



PARTS OR COMPONENTS TO BE REHABILITATED

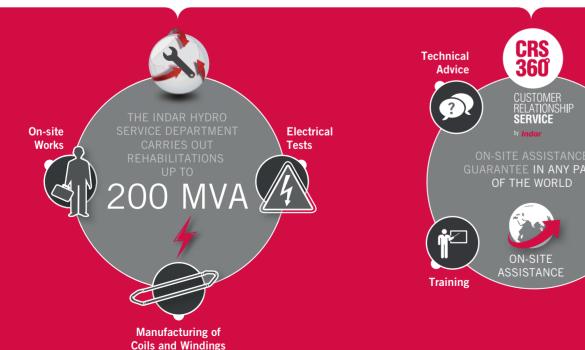
- Stator winding
- New entire stator (stator core + windings)
- Rewinding of the rotor poles
- New entire rotor

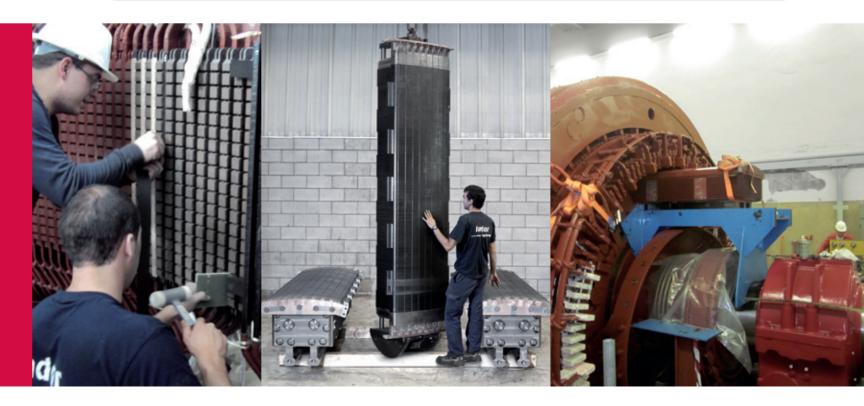


- Improvement in generator availability
- Improvement in operating reliability
- Increase in the power rating of the machine
- A higher level of efficiency, resulting in an increased production of electrical power in the same working conditions
- Increase in productivity
- Increase in the estimated useful life of the generator (reduction in investment)

APROVED BY THE MAIN EUROPEAN UTILITIES

- ENEL Endesa
- EDF Edipower







- New entire poles (pole cores + windings)
- · Rewedging the stator
- · Restoration of generator bearings
- The entire machine





Reduction in maintenance requirements (preventive and/or predictive) Minimisation of losses and production costs

- · Verbund
- · Vatenfall
- · Iberdrola
- EON