

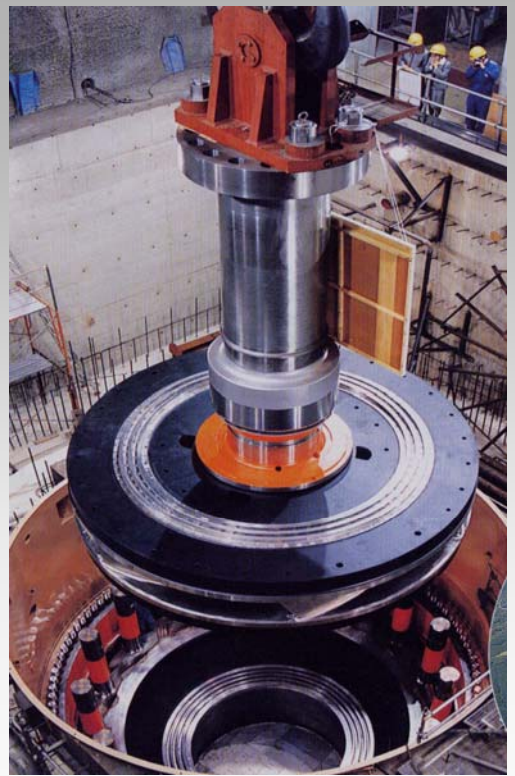
Rehabilitation Hydroelectric Equipment

H I T A C H I P O W E R S Y S T E M S A M E R I C A , L T D .



With superior technologies and proven worldwide experience, Hitachi offers reliable upgrade/refurbishment expertise toward hydroelectric generating equipment. Hardware supply, hydraulic laboratory testing, local field management and shop services provide a winning combination for Hitachi to perform every aspect of your next rehabilitation project.

- Turbine upgrade performance studies
- Runner replacement
- Runner model fabrication and test
- Upgrade to self-lubricated type bushings
- Shaft seal improvement technology
- For Kaplan and movable blade machines, upgrade to water filled hub
- For spherical type inlet valves, improvements toward seal mechanisms and addition of locking device for upstream seal
- For butterfly type inlet valves, improvements to Bi-plane type
- Governor renovation from mechanical or electrical to digital type
- Improvements in control philosophy on Pressure Relief Valves
- Control System Component Upgrade
- Additional auxiliary equipment supply
- Generator stator/rotor rewind and/or repowering (uprating)
- Design change of generator thrust bearing with Hitachi pivot spring type



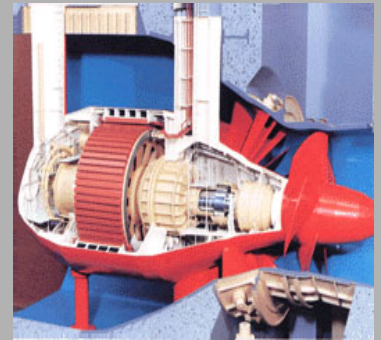
HITACHI POWER SYSTEMS AMERICA, LTD.

Hydro Turbine Type

- Pelton
- Francis
- Pump-Turbine
- Adjustable-Speed Pump/Storage
- Kaplan
- Diagonal
- Tubular
- Bulb

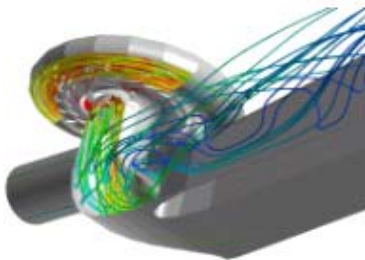
Hydro Turbine Products

- Spherical Valve
- Butterfly Valve
- Digital Governor
- Generator
- Generator – Motor
- Control Systems
- Excitation Systems



Engineering Assistance

- Upgrade Performance Studies
- Computational Fluid Dynamics (CFD)
- Finite Element Method (FEM)
- Model Runner Fabrication & Test



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