



**RenServ – RENOVATION,
MODERNISATION & UPGRADATION**

IT IS TIME TO CHANGE

MAKING OLD PLANTS NEW REDUCES RISKS AND GIVES A NEW LEASE OF LIFE TO YOUR VALUABLE INVESTMENTS

Performance, efficiency and reliability of generating sets in a Hydropower plant deteriorate over a period of time. Output, efficiency and reliability of generating units can be increased by replacing old or damaged components, by redesigning water passages and improving mechanical design.

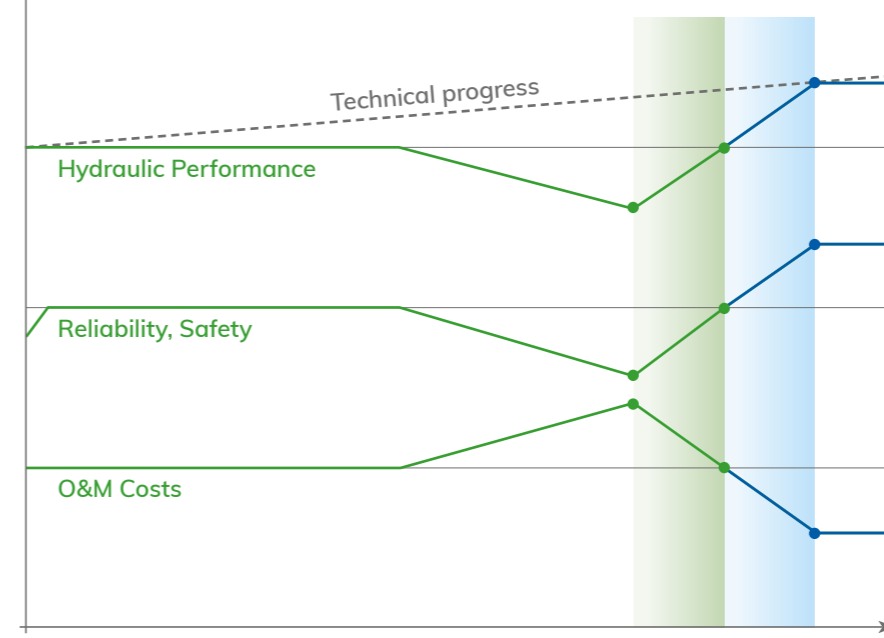
Following activities will reduce costs and risks of standstills:

- » Activities covering main equipment i.e. turbine, generator, C&I equipment and other plant equipment essential for efficient and sustained performance of the units.
- » Prioritisation of activities which have direct impact on improvement of generation, efficiency, machine availability etc.
- » Analysis with respect to design aspects which will yield uprating of units like rewinding of generator with change of insulation.
- » Supplying new runners with improved profile.
- » Replacing old governors with modernised fast acting digital governing systems.
- » Replacing and supplying state-of-the-art equipments such as Digital Static Excitation System, numerical relays with self diagnostic features, on line monitoring devices, water level and discharge measuring devices etc.



Rehabilitation or Refurbishment or Maintenance:
repair of components to original status

Modernisation or Upgrading or Uprating:
major added value (increased GWh)



BENEFITS OF PLANT RENOVATION & MODERNISATION

- » Higher plant availability
- » Lower downtime
- » Higher generation leading to Higher revenues
- » Reduction in O&M Costs leading to improved profits
- » Infuses new lease of life to the HEPs
- » Improved Health, Environment & Safety of plant and personnel



Maharaj Kar,
Chairman &
Managing
Director

“**RENOVATION, MODERNISATION & UPGRADATION (RenServ) HAS BEEN RECOGNISED WORLD OVER AS A WELL PROVEN COST EFFECTIVE TECHNIQUE FOR IMPROVING THE PERFORMANCE, EFFICIENCY AND RELIABILITY OF EXISTING HYDROPOWER PLANTS**”



FLOVEL is a full-line-supplier for Hydropower plants – manufacturer of hydraulic turbines, governors, excitation systems including valves and turnkey supplier of electro mechanical packages for Renovation & Modernisation services of Hydropower plants.

We provide Turnkey Hydropower Solutions – with cohesive integration of design, manufacturing, execution and service support. With our incessant focus on quality and total customer satisfaction, we have set new benchmarks in 'implementation finesse' that have translated into sustainable benefits for our customers.

Owing to extensive experience of FLOVEL in the Hydropower industry, FLOVEL is ideally placed to offer clients its customised solutions for Renovation, Modernisation, Upgradation / Uprating of any existing Hydropower plant.

SERVICE

Inspection

Repair

Replacement

MODERNISATION OR REHABILITATION

Diagnosis

Expert support

Modernisation

FLOVEL is certified for Integrated Management Systems, which includes ISO:9001, ISO:14001, OHSAS 18001 and CE Certification



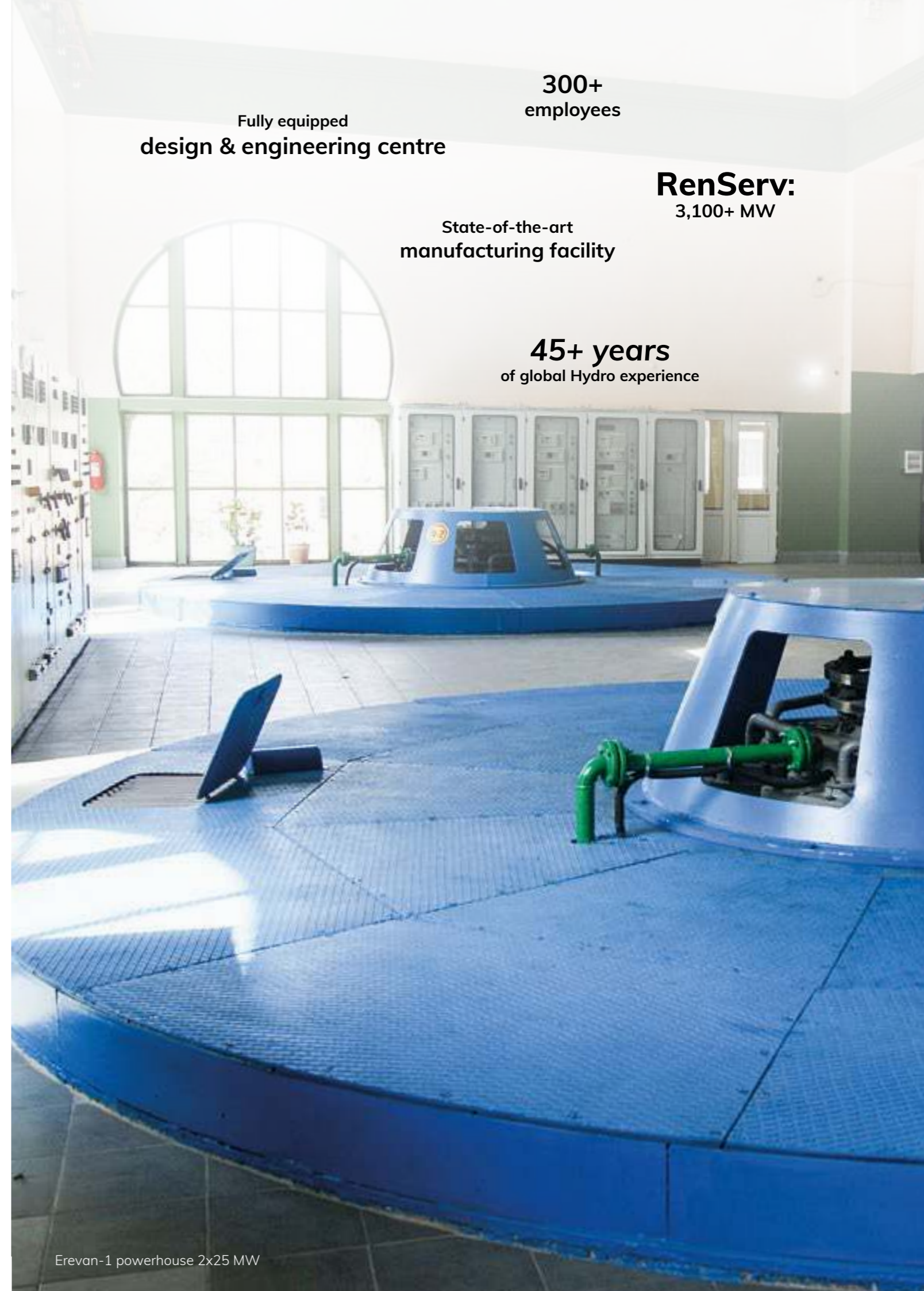
Fully equipped
design & engineering centre

300+
employees

State-of-the-art
manufacturing facility

RenServ:
3,100+ MW

45+ years
of global Hydro experience



Erevan-1 powerhouse 2x25 MW

RenServ

FLOVEL IS ADVANTAGEOUSLY
POSITIONED TO DELIVER MORE
MW PER MW

MAKING AN OLD TURBINE NEW

Hydropower equipment can be upgraded with the latest technologies

FLOVEL undertakes Renovation, Modernisation, Upgradation / Upgrading and Servicing of existing Hydropower plants of all types and sizes over its entire life cycle including own fleet and for equipment supplied by other manufacturers.

SCOPE OF WORK AND SERVICES OFFERED

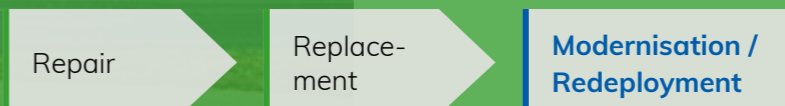
- » Plant Assessment
- » Reverse Engineering
- » Residual Life Analysis
- » Feasibility studies
- » Risk Assessment
- » General overhaul / Rehabilitation of complete plant including turbine, generator and related BoPs
- » HVOF coating and custom designed solutions for high silt content water
- » Upgrading / Modernisation of automation equipment
- » Model testing / CFD Analysis / FEM Analysis / Vibration Analysis
- » Site Performance Testing
- » Operations and Maintenance contracts
- » Spare parts management
- » Fault Analysis and Troubleshooting
- » Training services
- » Service technicians

STEPS INVOLVED

Planning

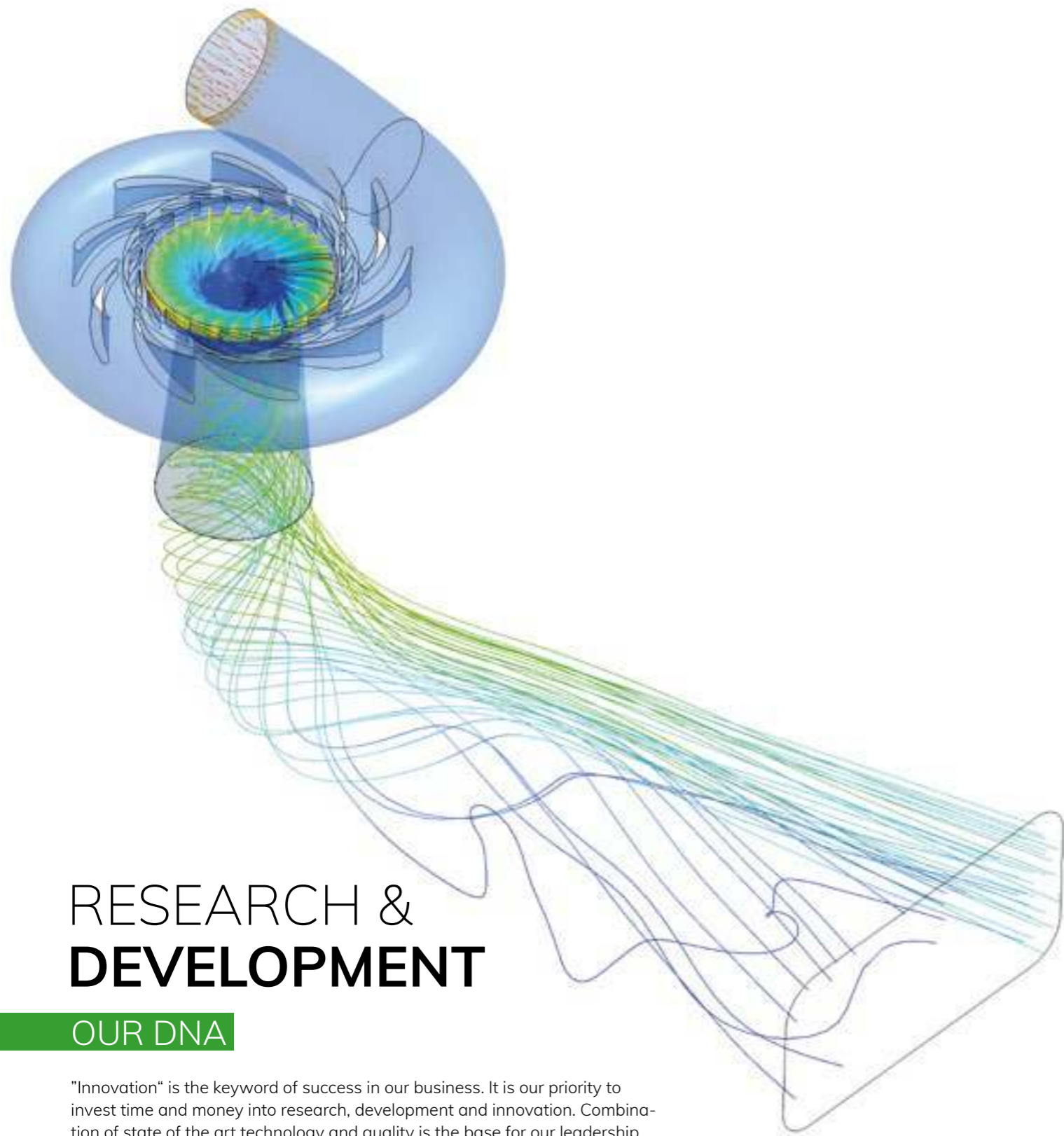


Action



ADVANTAGE ON YOUR SIDE

- » Customised & innovative solutions
- » Close to customer
- » High level Technical competency
- » Process oriented project management
- » Existing Civil structures are least affected
- » **3,100+ MW and still counting**



RESEARCH & DEVELOPMENT

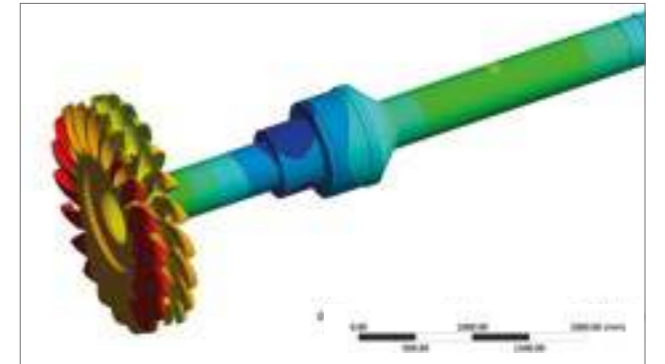
OUR DNA

"Innovation" is the keyword of success in our business. It is our priority to invest time and money into research, development and innovation. Combination of state of the art technology and quality is the base for our leadership position. It is our responsibility to deliver solutions with the best interest of customers in our mind."



MODEL TEST

Should the customer require a model test to be performed, FLOVEL is equipped to have a model test conducted at an accredited / independent model testing laboratory.

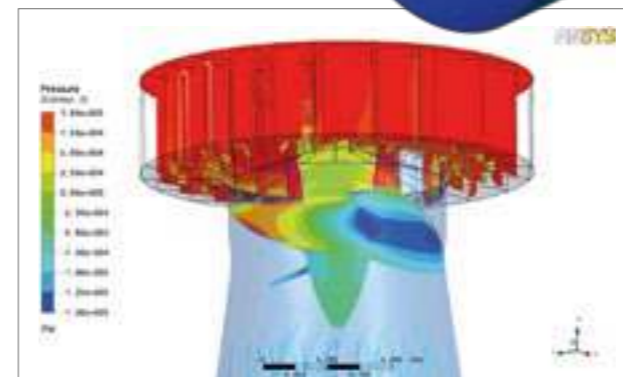
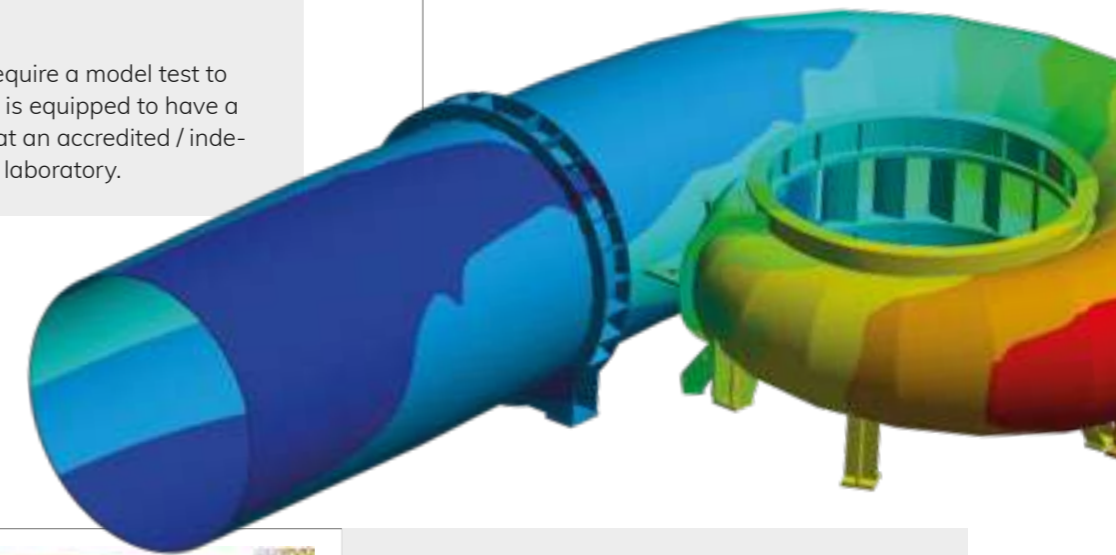


FEM

Finite element method (FEM) tools for calculating stresses, strains and deflections in components of a hydraulic turbine.

KARSBOL CONSULTING AB., SWEDEN

» Karsbol is a world leading technology provider for hydraulic turbines based out of Sweden. Karsbol specialises in research and development and design of Pelton, Francis, Kaplan and Axial Flow units.



CFD

Tools to accurately predict flow characteristic. CFD is used to improve hydraulic design of turbine water passages, including the runner and static components. For renovation projects CFD is a very important tool for improving turbine output, efficiency and cavitation characteristics.



A GOOD JOB FOR AN EXCITING MARKET

FLOVEL's key personnel and coworkers in all functions are among the best in the country with right educational qualifications and vast experience in their respective field and trained at various international locations to work to global standards. FLOVEL has a total strength of more than 300 people who by their knowledge, experience and innovative approach assure a competitive edge to the market and to a long term development of the company.



OUR MANUFACTURING FACILITIES.
WHERE EXCELLENCE IS MADE.



VALVES

FLOVEL manufactures full range of Valves under its joint venture with TB Hydro, Poland. These valves are manufactured by JV company TB Hydro Flovel Valves Private Limited.



**RenServ – UNLOCKING
THE POTENTIAL OF YOUR
EXISTING HYDROPOWER PLANTS**



MECHANICAL BOP & AUXILIARIES

SCOPE

- » Oil Pressure System for turbine, MIV & PPV
- » Cooling Water System
- » Drainage System
- » Dewatering System
- » Crane
- » Fire Fighting System
- » Ventilation & Air Conditioning System
- » Compressed Air System
- » Bearing Lubrication System
- » Oil Filtration System
- » Flow & Level Measurement System
- » Vibration Measurement System

ELECTRICAL BOP

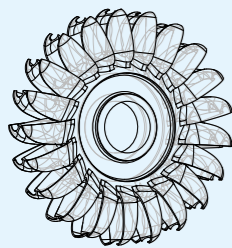
We deliver tailor-made systems as per customer requirements. Our solutions are safe, reliable and provide cost-effective operation. We are a single source provider ensuring complete service and seamless availability for your hydropower plant and all its components and systems. Our long-term process know-how and control system expertise in hydropower applications coupled with high efficiencies and post implementation service brings the Advantage on your side.



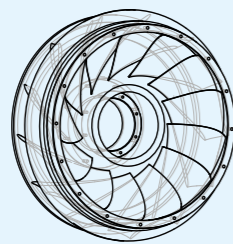
GOVERNOR, AUTOMATION & SCADA

DIGITAL GOVERNOR TECHNOLOGY

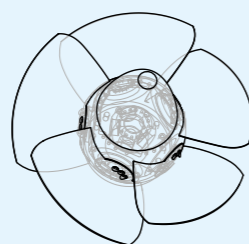
- » Integration of automation system, governing system, electrical system, mechanical system etc.
- » Digital automation of mechanical, electrical, LV system & other auxiliaries.



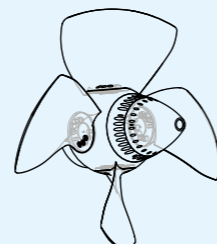
**PELTON
TURBINES**



**FRANCIS
TURBINES**



**KAPLAN
TURBINES**



**AXIAL FLOW
TURBINES**

FURTHER PROJECTS



BEFORE



Shanan, India

Type of Turbines: Vertical Pelton & Horizontal Pelton
 Design Head: 487.70 m
 Installed Capacity: 1 x 50,000 kW
 4 x 15,000 kW

Bhandardara, HEP, India

Type of Turbines: Vertical Francis
 Rated Head: 64.00 m
 Installed Capacity: 1 x 15,000 kW

Power Plants on Abohar Branch Canal, India

Type of Turbines: Semi Kaplan
 Installed Capacity: 5,500 kW

Power Plants on Bathinda Branch Canal, India

Type of Turbines: Full Kaplan
 Installed Capacity: 4,300 kW

Mettur Dam HEP, India

Type of Turbines: Horizontal Francis
 Rated Head: 48.77 m
 Installed Capacity: 4 x 12,000 kW

Shivasamudram HEP, India

Type of Turbines: Horizontal Francis
 Rated Head: 130.00 m
 Installed Capacity: 4 x 6,000 kW
 6 x 3,000 kW

Sholayar, India

Type of Turbines: Vertical Francis
 Rated Head: 303.00 m
 Installed Capacity: 3 x 19,800 kW

AFTER



Erevan 1, Armenia

Type of Turbines: Vertical Francis
 Rated Head: 88.35 m
 Installed Capacity: 2 x 25,000 kW

Upper Sindh, Stage II, HEP, India

Type of Turbines: Vertical Francis
 Rated Head: 224.00 m
 Installed Capacity: 3 x 35,000 kW



Mukerian, India

Type of Turbines: Vertical Full Kaplan
 Rated Head: 16.80 m & 22.00 m
 Installed Capacity: 6 x 15,000 kW +
 6 x 19,500 kW





GET IN TOUCH



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