FLOVEL
Advantage on your side

RenServ – RENOVATION, MODERNISATION & UPGRADATION

www.flovel.net

IT IS TIME TO CHANGE

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

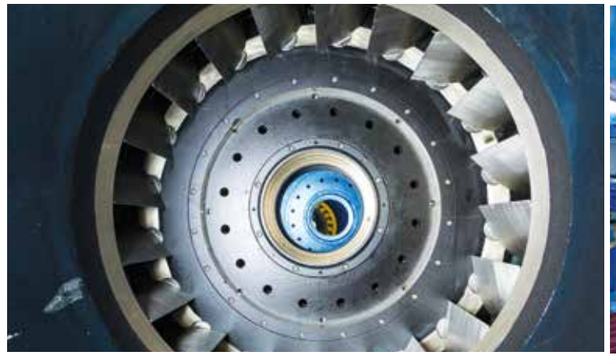
Performance, efficiency and reliability of generating sets in a Hydropower plant deteriorate over a period of time. Output, efficiency and reliability of generating units can be increased by replacing old or damaged components, by redesigning water passages and improving mechanical design.

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.

Before Renovation:

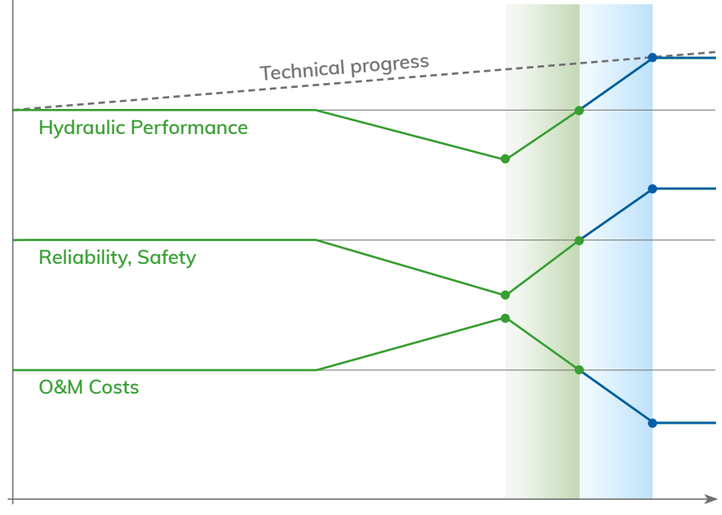
After Renovation:



Sholyar HEP 3 x 18 MW

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

Gautam Kar,
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
Advantage on your side

FLOVEL is a full-line-supplier for Hydropower plants – manufacturer of Hydraulic Turbines, Governors, Excitation systems, SCADA, 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 9001:2015, ISO:14001:2015, ISO 45001:2018 and CE Certification.


FLOVEL ENERGY PRIVATE LIMITED
ISO 9001:2015, ISO 14001:2015 & ISO 45001:2018


FLOVEL ENERGY PRIVATE LIMITED
ISO 9001:2015, ISO 14001:2015 & ISO 45001:2018


QSA INTERNATIONAL
Certificate of Registration
This is to certify that
Flovel Energy Private Limited
Council Machinery Directive 2006/42/EC
For the Products of
Turbine – Pelton, Kaplan, Axial and Francis under brand name "Flovel" including sub assemblies
By QSA International, UK
Certification Issue Date: 31 Oct 2020 – Certification Expiry Date: 30 Oct 2021
Registration Number : QSA-1502274
Initial Certification Date: 04 Jan 2011
Re-Certification Date: 31 Oct 2020
Certification Expiry Date: 30 Oct 2025
CGR

300+
employees

Fully equipped
design & engineering centre

RenServ:
3,500+ MW

State-of-the-art
manufacturing facility

50+ years
of global Hydro experience

Erevan-1 powerhouse 2x25 MW

RenServ

FLOVEL IS ADVANTAGEOUSLY POSITIONED TO DELIVER MORE MW PER MW

ADVANTAGE ON YOUR SIDE

- Customised & innovative solutions
- Close to customer
- High level Technical competency
- Process oriented project management
- Existing Civil structures are least affected
- **3,500+ MW and still counting**

MAKING AN OLD TURBINE NEW

Hydropower equipment can be upgraded with the latest technologies

FLOVEL undertakes Renovation, Modernisation, Upgradation / Uprating 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

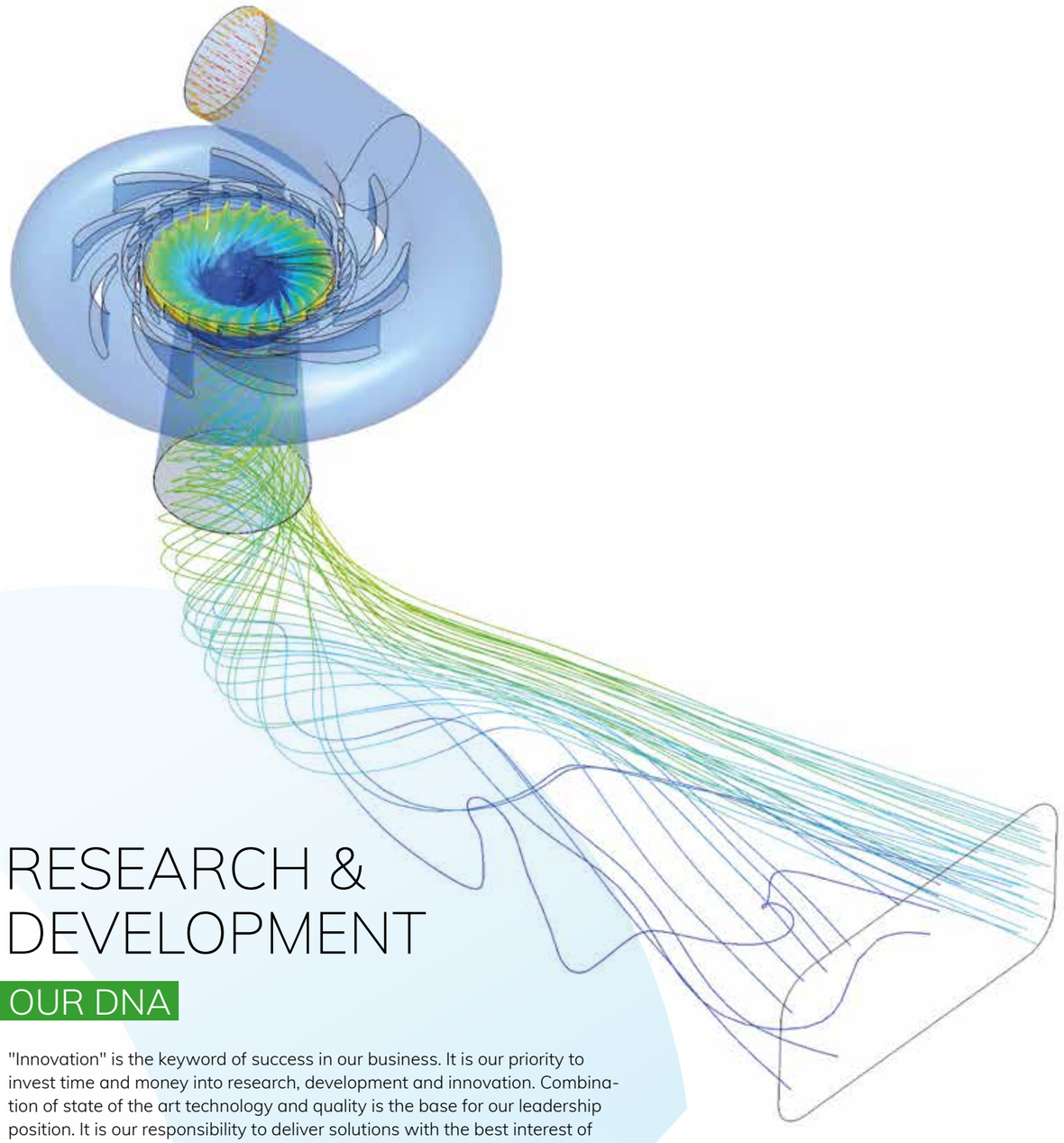
STEPS INVOLVED

Planning

Diagnosis → Site visits / Study → Inspection / Test → **Report submission**

Action

Repair → Replace-ment → **Modernisation / Redeployment**



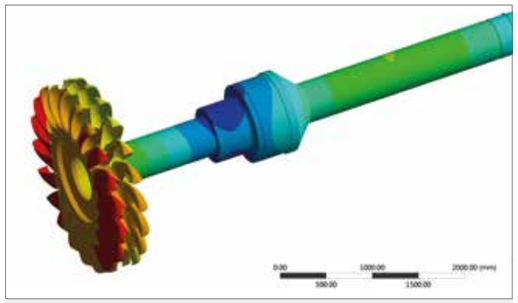
RESEARCH & DEVELOPMENT

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.

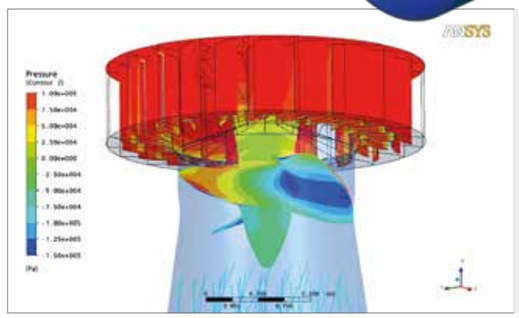
MODEL TEST

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.



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.

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

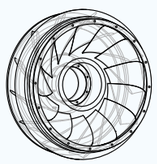
We deliver tailor-made systems as per customer requirements. Our solutions are safe, reliable and provide cost-effective operation. We are a single source provider ensuring complete service and seamless availability for your hydropower plant and all its components and systems. Our long-term process know-how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

GOVERNOR, AUTOMATION & SCADA

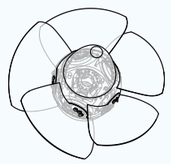
POWER GENERATION OPTIMIZATION (PGO) IS DEVELOPED BY FLOVEL FOR:

- » Optimization of generation with time stamped sequencer
- » Monitoring of plant parameters, Weather & Dam level
- » Email reporting & SMS services
- » Chatbot (Let's talk to the plant)
- » Mobile application for real time data
- » Plant Load Factor

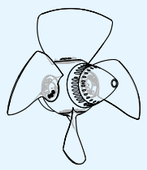
PELTON TURBINES



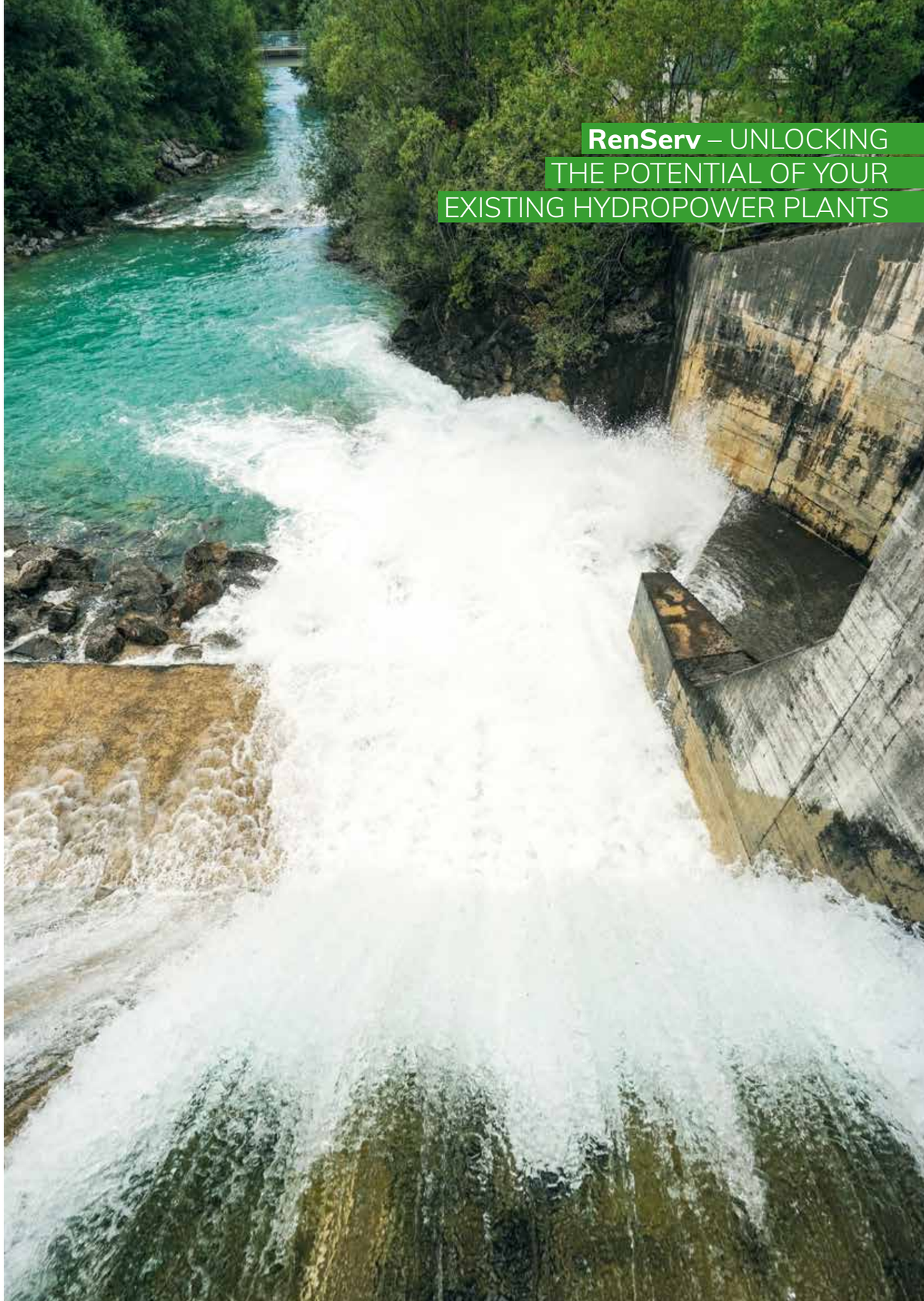
FRANCIS TURBINES



KAPLAN TURBINES



AXIAL FLOW TURBINES



BEFORE

Sholayar, India

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

AFTER

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

Erevan 1, Armenia

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

Upper Sindh, Stage II, HEP, India

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

50 years

ADVANTAGE
ON YOUR SIDE

GET IN TOUCH

FLOVEL
Advantage on your side

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