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FLOVEL

FLOVEL Energy Private Limited

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FROM WATER TO ELECTRICITY

RenServ – for sustainable Growth

www.flovel.net

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

Gautam Kar
Managing Director

RenServ
FOR SUSTAINABLE GROWTH

Renovation in hydro power projects is essential to maintain efficiency, ensure safety, lower operation and maintenance cost, and adapt to evolving technological and environmental standards. These upgrades not only enhance energy output but also contribute to the long-term sustainability of renewable energy systems.

Over time, mechanical components like turbines and generators experience wear and tear, reducing their efficiency. Renovation involves upgrading or replacing outdated equipment, which can boost energy generation.

Renovation in hydro power projects is not just a maintenance activity—it is an investment in sustainable energy, environmental preservation, and economic growth. With global energy demands rising and climate challenges intensifying, the modernization of hydro infrastructure is critical to securing a safe and greener future.

FLOVEL
Driving force for a better course

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

400+
employees

Fully equipped
design & engineering centre

7,000+ MW
Capacity Served

State-of-the-art
manufacturing facility

54+ years
of global Hydro experience

Erevan-1 powerhouse 2 x 25 MW

RenServ Success Stories and Global Examples

By the end of 1980, FLOVEL, (started in 1971) had firmly established its reputation as a reliable and high-quality equipment manufacturer for the hydroelectric plants. Building on its solid foundation, the company was poised to expand into larger market segments. FLOVEL's consistent focus on delivering dependable solutions earned the trust of key clients, including state electricity boards and power departments, which were the primary developers of hydro projects during that period. These partnerships marked a significant milestone in FLOVEL's journey, setting the stage for its sustained growth and influence in the renewable energy sector.

FLOVEL made a significant entry into Renovation and Modernization (R&M) projects, securing prestigious contracts for Mahatma Gandhi Jog Falls (4 units of 13.2 MW and 4 units of 21.2 MW) and Shivasamudram HEP (4 units of 6.0 MW and 6 units of 3.0 MW) from Karnataka Power Transmission Corporation Ltd. during 1998 and 1999. This was followed by notable projects like the 15.0 MW Bhandardhara in Maharashtra and Munirabad in Karnataka.

These achievements were particularly commendable as they were secured in tough competition with BHEL, a Government of India enterprise that had dominated the R&M space until then in the Indian market.

Between 2001 and 2005, FLOVEL successfully secured and executed several prestigious projects, establishing its strong presence in both large and small hydropower sectors.
During this period, FLOVEL also executed key Renovation & Modernization (R&M) projects, including:

» **Mettur Dam**: (4 units of 12.0 MW)
» **Papanasam**: (4 units of 8.0 MW)
» **Sabrigiri**: (6 units of 60.0 MW)
» **Nagjhari**: (3 units of 135.0 MW)

After the Kar family divested its entire equity stake, FLOVEL resumed operations in November 2006 under the leadership of **Mr. Maharaj Kar**, who took charge as Chairman & Managing Director. The company was reestablished as **FLOVEL Energy Private Limited**, carrying forward its hard-earned legacy.

Since FLOVEL's inception the majority team of experts have remained alongside the FLOVEL's management ensuring a seamless experts in hydro business and retaining the expertise and unity that .

Scope of Work and Services Offered by FLOVEL for Renovation, Modernization & Uprating of Hydro Power Plants:

» **Plant Assessment**: Comprehensive evaluation of the plant's current condition and performance.
» **Reverse Engineering**: Upgrading the equipment while analysing the existing one.
» **Residual Life Analysis**: Assessment of the remaining useful life of equipment and systems.
» **Feasibility Studies**: In-depth studies to assess the technical, economic, and environmental feasibility of projects.
» **Risk Assessment**: Identification and mitigation of potential risks in plant operations and maintenance.
» **Complete RM&U**: Complete renovation, modernization and Uprating for Hydro Power Plant including Electro-mechanical, Civil, Hydro-Mechanical works and Switchyard.
» **General Overhaul / Rehabilitation**: Complete overhaul and rehabilitation of the plant, including turbines, generators, and related Balance of Plant (BoP) components.
» **HVOF Coating**: High-Velocity Oxygen Fuel (HVOF) coating and custom-designed solutions for plants operating in high silt content water.
» **Upgrading / Modernization of Automation Equipment**: Revamping control systems and automation technologies for improved performance.
» **Model Testing / CFD Analysis / FEM Analysis / Vibration Analysis**: Advanced testing and simulations to optimize plant performance.
» **Site Performance Testing**: On-site testing to verify equipment functionality and efficiency.
» **Operations and Maintenance Contracts**: Comprehensive O&M services to ensure the smooth operation and longevity of hydropower plants.
» **Spare Parts Management**: Efficient management and supply of critical spare parts.
» **Fault Analysis and Troubleshooting**: Identification and resolution of operational issues.
» **Training Services**: Providing training for plant personnel to ensure efficient operation and maintenance.
» **Service Technicians**: Expert service personnel available for on-site assistance and repairs.

FLOVEL specializes in the **Renovation, Modernization, Upgradation/Uprating,** and **Servicing** of existing hydropower plants of all types and sizes, across their entire life cycle. This includes work on FLOVEL's own fleet and equipment supplied by other manufacturers as well.

FLOVEL's Significant Milestones on Renovation & Services

FLOVEL has achieved several significant milestones in recent years, showcasing its expertise and expanding global presence in the hydropower sector. Some of the key projects includes:

1. Erevan-I HEP Renovation Project (Yerevan, Armenia), 2 x 25 MW, Vertical Francis Turbine

FLOVEL marked its entry into the CIS countries by securing the **Erevan-I HEP Renovation Project**, which involved two units of 25 MW each.

The Plant Operational Chart:
» Altitude above the sea level: 974 m
» Number of Units: 2
» Unit Capacity: 25 MW
» Type of Turbine: Vertical Francis

Project Highlights:
The Erevan Hydroelectric Power Plant-1 is located between the Kanaker and Erevan-3 stations, at the central Kentron District of Yerevan. It has two turbines with the total initially installed nominal capacity of 44 MW and Unit capacity of 22 MW.

The Yerevan Hydroelectric Power Plant is part of the Sevan–Hrazdan Cascade hydropower system in Armenia.

At the Yerevan HPP N1 and N2 Ukrainian-made 22 MW turbines produced by the Kharkov Turbine Plant in 1960 were replaced by new F 607/16: 25.79 MW Indian-made FLOVEL turbines in 2017. The unit was uprated to 25 MW each.

This comprehensive renovation included complete Electro-Mechanical equipment including BoP, MIV and automation systems, highlighting FLOVEL's ability to execute complex projects.

The scope of the work includes:
Replacement of MIV, PRV and turbines with new ones while retaining the existing spiral casing. The existing 18 MW generators was replaced with new generator of same rating with 10% Continuous Over Loading capacity including excitation system, governor system etc. The scope also covered complete replacement of complete BoP equipment. This project demonstrates FLOVEL's expertise in comprehensive hydroelectric power plant upgrades, emphasizing both technical precision and capacity enhancement. By conducting turbine model tests in a European laboratory, FLOVEL ensured rigorous performance validation and design optimization. The complete replacement of turbines, valves, generators, mechanical and electrical Balance of Plant (BOP), and control automation systems reflects their capability to manage extensive modernization efforts.

Additionally, uprating the machines by 10%—from the original 18 MW units—illustrates their proficiency in boosting plant efficiency and power output while maintaining operational reliability. This project underscores FLOVEL's ability to execute large-scale upgrades, aligning with global standards and technological advancements.

2. Sholayar HEP Renovation Project (KSEB, Kerala, India), 3 x 18 MW + 10% COL Vertical Francis Turbine

Another major renovation project was the **Sholayar HEP** in Kerala, located in southern part of the Republic of India owned by Kerala State Electricity Board Limited (Erstwhile KSEB) is a fully Government owned company which includes three units of 18 MW each Vertical Francis turbines.

Project Salient Details:
» Discharge: 7.787 m^3/sec
» Net Head: 303 m
» Speed: 750 rpm
» Turbine (OEM): Titovizavedi, Litrostoj, Yugoslavia, Year: 1963
» Generator (OEM): Rade Končar, Yugoslavia

3. USHP -II Hydel Powerhouse, Kangan (JKSPDC, J&K, India), 3 x 35 MW

The project got commissioned in 1973 and was equipped with Bharat Heavy Electricals Francis turbines with 35 MW nameplate capacity each. Here's a summary of FLOVEL's contribution to the 3 x 35 MW powerhouse of USHP-II, Kangan, managed by the Jammu & Kashmir Power Development Corporation:

A brief Scope of Work includes:
1. Design, Engineering, and Installation:
» **Delivered a computer-based automation system** for centralized operation from the powerhouse control room.
» **Ensured comprehensive training** for the purchaser's personnel.

2. Technological Upgrades:
» **Excitation System:** Replaced the old semi-static system with a cutting-edge dual-channel fully static system.
» **Governor System:** Installed a microprocessor-based electronic governor for enhanced performance.
» **Control & Relay Panels:** Upgraded to digital numerical relay systems. Integrated modern protection, metering, and auto-synchronization systems.
» **SCADA Implementation:** Enabled computerized control and monitoring for efficient plant operation.

FLOVEL delivered on its promise by completing the project within the stipulated timeline, successfully mitigating potential generation losses and significantly modernizing the facility. This not only reflects our dedication to quality and efficiency but also sets a benchmark for future automation projects in the hydropower sector as well. This achievement by FLOVEL highlights our capability to deliver advanced automation solutions for hydropower projects. Securing and executing such a comprehensive order showcases our technical expertise and commitment to innovation. Such upgrades ensure reliability, improve operational efficiency, and enhance the sustainability of power generation.

4. Iruttukanam SHP (Kerala, India), 3 x 1.5 MW + 10% COL

In August 2018, Kerala faced an unprecedented catastrophe with devastating floods and massive landslides, resulting in the destruction of this hydropower project, the powerhouse and all electromechanical devices were submerged in water and buried under piles of dirt and mud.

Despite the overwhelming damage, FLOVEL was called upon to assess the situation and evaluate the possibility of quickly restoring power generation. The customer's primary concern was to recover quickly to maintain the economic profitability of the project. FLOVEL's team of experts conducted a thorough inspection of the equipment at the disaster site, compiling a detailed report outlining the steps necessary for restoration.

The tricky challenge for FLOVEL was the task of disassembling the entire turbine, transporting it to the factory for repairs, and restoring it to its original condition in a very short span of time. In addition to this, FLOVEL was responsible for the restoration of both Mechanical-Balance of Plant (M-BOP) and Electrical-Balance of Plant (E-BOP) components. Despite the enormous challenge, FLOVEL took on the responsibility and completed the project in line with the contractual completion period, meeting the customer's expectations and putting the plant back into operation, much to the satisfaction of the client.

This project highlights FLOVEL's capability in handling extreme conditions and highlighted its expertise in quick recovery and restoration of critical hydropower infrastructure.

5. Lower Jhelum Hydel Powerhouse (JKSPDC, Jammu & Kashmir, India), 3 x 35 MW

FLOVEL Energy Private Limited continues to set benchmarks in the hydropower sector with its successful execution of the automation project for the 105 MW Lower Jhelum Hydel Powerhouse in Kashmir. Owned by the Jammu & Kashmir State Power Development Corporation, this project exemplifies FLOVEL's expertise in integrating advanced technology with precision execution.

Salient Features of Project:

- Unit Capacity: 35 MW
- No. of Units: 3 Nos.
- Rated net head: 61 m
- Rated Discharge: 18.21 m^3/Sec
- Type of Turbine: Vertical Francis
- Speed: 214 rpm

Comprehensive Approach to Modernization

The project entailed the complete automation of the powerhouse, encompassing:

- Design and Engineering: Tailored solutions to meet the specific requirements of the Lower Jhelum Hydel Powerhouse.
- Dual Channel Digital Excitation System: Ensuring reliable and efficient energy output.
- Numerical Protective Relay and Control Systems: Advanced protection mechanisms for seamless operations.
- Microprocessor-Based Digital Governor System: Optimizing turbine performance for enhanced efficiency.
- HMC Cabinet and SCADA Systems: Cutting-edge monitoring and control systems for operational excellence.

In addition to these installations, FLOVEL undertook dismantling of the existing equipment and associated civil works, reflecting its end-to-end project management capabilities.

Delivering Excellence on Time

Despite the complexities of the project, FLOVEL completed the automation initiative within the stipulated timeframe. This timely execution underscores FLOVEL's commitment to quality, reliability, and efficiency in the hydropower domain.

Empowering Sustainable Energy in Kashmir

The successful automation of the Lower Jhelum Hydel Powerhouse not only boosts its operational efficiency but also contributes to the region's sustainable energy aspirations. By leveraging modern automation technology, FLOVEL has enhanced the plant's capacity to deliver uninterrupted power, supporting economic growth and environmental sustainability in Kashmir.

FLOVEL's achievement at the Lower Jhelum Hydel Powerhouse further cements its reputation as a leader in the global hydropower sector, paving the way for a greener, more efficient energy future.

6. Dhakrani HEP (UJVNL, Uttarakhand, India), 3 x 11.25 MW + 10% COL, Vertical Kaplan

In 2021-22, FLOVEL secured the **Dhakrani HEP** project from **UJVNL**. The plant has a total capacity of 37.13 MW, with three units of Vertical Kaplan turbines. The project includes the complete Renovation, Modernization, and Upgradation (RMU) of the turbines, generators, automation systems, and other BOP components, Civil & Hydro-mechanical Works and Switchyard, reinforcing FLOVEL's ability to enhance and optimize hydropower plants. The 37.13 MW Dhakrani Power Station (3 x 11.25 MW + 10% COL) capacity located in district Dehradun at approximately 40 km from nearest railway station Dehradun.

The brief project Scope is as follows:

FLOVEL is responsible for designing, manufacturing, supply, installation, testing & commissioning of Turbine and Generator for under RM&U of this Project along with BOPs, Automation, Hydro-Mechanical & associated Civil Works.

Turbines:

- Turbine type: Kaplan
- Disposition: vertically arranged
- Manufacturer: LITOSTROJ, Yugoslavia
- No. of Turbines: 3
- Commissioning Years: 1965 / 1966 / 1970

Design Data:

- Net design head: 19.6 m
- Flow at design head: 66.4 m^3/s
- Turbine output: 11.75 MW (at design head)
- Synchronous speed: 187.5 rpm

Runner:

- Diameter: 3,400 mm
- No. of Blades: 06 No's

Generators:

- Manufacturer: Rade Končar, Yugoslavia
- Number of units: 03 No's
- Rated Output: 12.50 MVA
- Synchronous Speed: 187.5 rpm

FLOVEL Energy Private Limited has reached a remarkable milestone in the development of India's hydroelectric capabilities. Demonstrating its commitment to advanced engineering and state-of-the-art manufacturing, FLOVEL has successfully conducted a model test and manufactured the turbine runner for this project. This achievement was carried out at FLOVEL's cutting-edge facility, recognized as one of the most technologically advanced in the country.

Currently, the project is under execution phase, and FLOVEL is proud to announce the successful supplies of equipment for the first unit which is under commissioning. This marks a significant step forward in the implementation of the highest-capacity Kaplan Turbine Hydro Electric Project undertaken by FLOVEL to date.

With this achievement, FLOVEL continues to reinforce its leadership in the hydropower sector, setting new benchmarks in design, manufacturing, and execution, and contributing to India's vision of sustainable energy development.

Unlocking the potential of your existing hydropower plants

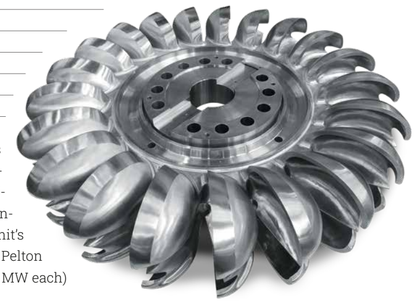
7. Koyna Stage II Renovation Project (MAHAGENCO, Maharastra, India), 4 x 80 MW, Vertical Pelton

In 2023, FLOVEL secured a prestigious order from **MAHAGENCO** for the **Koyna Stage II**, part of the renowned **Koyna HEP complex** in Maharashtra. This order, involving the supply of two fully forged 6-Jet Pelton Runners with a capacity of 80 MW each, marks a significant achievement for FLOVEL, as it is the largest unit capacity Pelton Runner project in the company's history. The project includes turbines with technical specifications such as a rated head of 490 m, a finished weight of 9.55 tons, and a rated speed of 375 rpm. This project was secured through a highly competitive bidding process, demonstrating FLOVEL's position as a leader in the Pelton turbine segment.

A brief detail of the project is as follows:

The Technical Particulars of Stage-II Runner:

- Type of Turbine: Vertical shaft impulse turbine (Pelton)
- Rated Output: 80 MW
- Rated head: 490 m
- Rated speed: 375 rpm
- Maximum Head: 514.50 m
- Minimum Head: 457 m
- OEM: BHEL



FLOVEL's Scope includes Design, Engineering, Manufacturing, Supply, supervision of Erection, Commissioning & testing for 80 MW unit's capacity fully forged New Pelton runner for Stage II units (80 MW each) at Stage I & II, Pophali.

FLOVEL Energy Private Limited has achieved another milestone by successfully manufacturing 80 MW capacity Pelton Runner at its advanced manufacturing facility in Palwal, Haryana. This accomplishment highlights FLOVEL's expertise in delivering high-performance hydroelectric equipment designed to meet the rigorous demands of modern hydropower projects.

The state-of-the-art facility in Palwal is a testament to FLOVEL's commitment to innovation and precision engineering, enabling the company to contribute significantly to the hydropower sector both in India and globally. This achievement reinforces FLOVEL's position as a leader in sustainable energy solutions.

"Innovation" is the keyword of success in our business

8. Shanan Powerhouse (PSPCL, Jogindernagar, Himachal Pradesh, India), 4 x 15 MW Horizontal Pelton Turbine + 1 x 50 MW Vertical Pelton Turbine

110 MW Shanan Project is originally commissioned in 1932 situated 2 km from Jogindernagar in Himachal Pradesh, India. It is the first hydroelectric power project of India in megawatt capacity. The Shanan Power house is currently under the control of Punjab State Power Corporation Limited. The Shanan powerhouse is situated at an elevation of 1,283 m (4,212 ft) ft.

Salient Features of Shanan Power House:

	Stage – I	Shanan Extension
Rating of each unit:	15 MW	50 MW
No. of units at PH:	4 No's	1 No
Manufacturer of Turbine:	GANZ MAVAG, Hungary	
Generator Type:	Horizontal Shaft	Vertical shaft
Speed:	428.5 rpm	375 rpm

The Scope includes Design, manufacture, supply, erection, testing and commissioning of of new one set of Microprocessor based Static Excitation system along with accessories for 50 MW Hydro Generator unit including dismantling of existing panels, equipment cables etc.

FLOVEL has successfully upgraded the Shanan Hydel Project by replacing the existing excitation systems, including Automatic Voltage Regulators (AVRs), with advanced static excitation systems and modern, digital technology-based AVRs. This enhancement was implemented for 50 MW machine. The PSS requirement of the customer was also met and demonstrated at site.

The adoption of static excitation systems and cutting-edge digital AVRs not only improves the reliability and precision of voltage regulation but also enhances the overall efficiency and responsiveness of the hydroelectric plant. This upgrade highlights FLOVEL's commitment to integrating state-of-the-art technologies in hydroelectric power generation systems.

9. Mukerian Powerhouse: (PSPCL, Punjab, India), 6 x 15 MW + 6 x 19.5 MW

Mukerian Hydel Project is situated in Distt Hoshiarpur, Punjab and is a canal-based Power Project which comprises of Four Power Houses constructed on Mukerian Hydel Channel. Power houses are located near Talwara, Hajipur, Village.

Total installed capacity at MHP is 207 MW. Comprising of:

» MPH-I (Unit no. 1, 2 & 3): 3 x 15 MW
» MPH-II (Unit no. 4, 5 & 6): 3 x 15 MW
» MPH-III (Unit no. 7, 8 & 9): 3 x 19.5 MW
» MPH-IV (Unit no. 10, 11 & 12): 3 x 19.5 MW

The Scope includes Design, manufacture, supply, erection, testing and commissioning of twelve sets (Six sets each for 15 MW & 19.5 MW Hydro generators of MHP) of microprocessor based static excitation equipment along with accessories (including dismantling of existing panels, equipment, cables etc).

Climatic Conditions & Project Data

1. Maximum temperature: 500
2. Minimum Temperature: (-20)
3. Make: BHEL BHOPAL
4. Rated Net Head: 16.8 m(MPH-I & II)/ 21.95 m (MPH-III & IV)
5. Type of Turbine: Kaplan
6. Generator rated speed: 150 (MPH-I & II)/ 166.7 rpm (MPH-III & IV)

FLOVEL has successfully upgraded the Mukerian Hydel Project by replacing the existing excitation systems, including Automatic Voltage Regulators (AVRs), with advanced static excitation systems and modern, digital technology-based AVRs. This enhancement was implemented across all twelve machines of the project. The PSS requirement of the customer was also met and demonstrated at site.

The adoption of static excitation systems and cutting-edge digital AVRs not only improves the reliability and precision of voltage regulation but also enhances the overall efficiency and responsiveness of the hydroelectric plant. This upgrade highlights FLOVEL's commitment to integrating state-of-the-art technologies in hydroelectric power generation systems.

10. Punjab GenCo (8 MHPs at Bhatinda and Abohar Branch Canal), Total Capacity: 9.80 MW

FLOVEL is proud to have secured a significant order for the renovation and modernization of eight Mini Hydel Plants owned by Punjab Generating Company Limited, a Government of Punjab utility in renewable energy. These generating units are located along the Bhatinda and Abohar branch canals and are owned by the Punjab Generating Company.

Details of the projects as follow:

Abohar Branch Canal (5.5 MW)
» Chupki MHP (Ludhiana)
» Narangwal MHP (Ludhiana)
» Tugal MHP
» Dalla MHP

Bathinda Branch canal (4.3 MW)
» Bowani MHP (Ludhiana)
» Khatra MHP (Ludhiana)
» Jagera MHP (Ludhiana)
» Kanganwal MHP (Sangrur)

FLOVEL's expert team successfully undertook the refurbishment of these units, employing advanced engineering solutions and state-of-the-art technology. The modernization process ensured that the plants of total generating capacity (**9.80 MW**) are now optimized for reliable and uninterrupted power generation. This achievement reflects FLOVEL's commitment to supporting sustainable energy infrastructure and enhancing the efficiency of existing hydropower facilities.

With a legacy steeped in excellence and an eye toward the future, FLOVEL continues to push boundaries in the renovation and modernization of hydropower plants. Its projects not only illuminate its technical expertise but also its vision of a world powered by clean, reliable, and sustainable energy.

11. Budhil HEP GreenKo Group, 2 x 35 MW (Vertical Francis Turbine)

The Budhil Hydro Electric Project (BHEP) is a run-of-the river hydro project on the Budhil stream, a major tributary of the Ravi River, in the Chamba district of the state of Himachal Pradesh in India. The project having an installed capacity of 70 MW has been in operation since May 2012. The project after being acquired from Lanco group is being referred as Greenko Budhil Hydro Power Private Limited. The project utilizes gross head of 252 m m with design discharge of 34 cumecs to generate 313.33 GWh for 90% dependable year.

Salient Features of Project:

» Unit Capacity: 2 x 35 MW
» Rated net head: 237.5 m
» Rated Discharge: 16.4 m³/Sec
» Type of Turbine: Vertical Francis
» Speed: 500 rpm

FLOVEL has taken on an exceptional project involving the reverse engineering, design, manufacturing, and supply of vital turbine components, including a **casted Francis Runner, Top Cover, and Bottom Cover**. These units were originally manufactured, supplied & commissioned by **M/s DongFang Electric Corporation**.

The project presents a unique technical challenge ensuring the newly supplied components seamlessly integrate with the **existing components and embedded parts** to achieve the desired performance with the silt resistant design. Notably, this project features the **largest capacity Francis Runner executed by FLOVEL for an IPP, rated at an impressive 35 MW**. Additionally, FLOVEL has already demonstrated its proficiency by successfully **repairing an existing Runner** at the same power plant. This achievement underscores FLOVEL's position as a trusted leader in advanced turbine solutions.

The Budhil Hydro Electric Project (BHEP) faced significant challenges due to silt-related issues, which caused severe erosion in the runner. FLOVEL has conducted a comprehensive condition monitoring and addressed these challenges head-on. The damaged runner was skilfully repaired at our state-of-the-art facility, using advanced manufacturing processes, and delivered to the site on schedule.

FLOVEL's commitment to excellence, precision, and quality in manufacturing not only minimized generation downtime but also ensured complete customer satisfaction. This success has paved the way for a future order, which includes the design, manufacturing, and supply of a new runner along with top and bottom covers. Leveraging FLOVEL's advanced design philosophy, the new equipment is engineered to withstand silt erosion, ensuring enhanced durability and an extended operational lifespan.

12. BRUA Hydro Electric Project, 2 x 4.5 MW + 10% COL

Brua Hydro Electric Project (5MW) situated in Kinnaur District of Himachal Pradesh is owned by Brua Hydrowatt (P) Limited, a company based in Kolkata.

The project parameters are as follows:

» Type of Turbines: Horizontal Pelton 2 Jets
» Rated Head: 572.73 m
» Installed Capacity: 2 x 4.5 MW + 10% COL

The Brua Hydro Electric Project, awarded to M/s FLOVEL Energy Private Limited and commissioned on April 14, 2016, faced unprecedented challenges in 2023 due to heavy rainfall in Himachal Pradesh. Flash floods, cloudbursts, and landslides severely impacted the region, causing extensive damage to multiple hydroelectric projects, including the complete washout of the Brua project's Switchyard area.

Rising to the occasion, FLOVEL undertook the complex task of restoring the Switchyard. This comprehensive effort included the design of the Switchyard layout, manufacturing and supply of equipment, as well as installation and commissioning. Despite the challenges, FLOVEL completed the restoration within the scheduled timeline, and handed over to the customer as promised.

This accomplishment reflects FLOVEL's resilience, technical expertise, and commitment to delivering reliable solutions under demanding circumstances.

FLOVEL is advantageously positioned to deliver more MW per MW

13. Balsio Hydel Project (Himachal Pradesh, India), 2 x 2.5 MW + 20% COL

The Balsio Hydel Project has a power generation capacity of 5 MW which has been installed to augment the power generation in Himachal Pradesh using renewable energy.

Technical details of the Project:

» Gross Head: 81.2 m
» Net Head : 80.98 m
» Design discharge: 7.4 m^3/sec
» Type of Turbine: Horizontal Francis
» No of Units : 2 No's
» Unit Capacity: 2.5 MW

In late August 2023, Himachal Pradesh and Uttarakhand experienced heavy rains and cloudbursts, leading to catastrophic floods. These floods caused significant damage, including to vital infrastructure like hydropower projects in Himachal Pradesh.

Among the affected facilities was the Balsio Hydel Project, which was submerged due to the deluge. Despite the extent of the damage, the equipment at the project was successfully restored by the dedicated efforts of FLOVEL's experts and engineers, showcasing their technical expertise and commitment to rapid recovery in challenging circumstances.

14. Gandhisagar HPS (5 x 23 MW)

Background of the Project:

Gandhi Sagar HPS is located in Mandsaur district in the state of Madhya Pradesh – a central part of India. This hydro plant consists of 5 units which were originally commissioned from 1960 to 1966. All the units are Vertical Francis machines. The plant is owned and operated by M/s. **Madhya Pradesh Power Generating Company Ltd (MPPGCL)**. This plant is located on Chambal River. The unit generated from this plant is shared between the two states (of India) – Madhya Pradesh and Rajasthan.

The original unit wise commissioning of the plants are as under:

Unit	Year	Make of Turbine	Make of Generator
Unit – I	19-11-1960	Voith	Siemens
Unit – II	19-11-1960	Voith	Siemens
Unit – III	19-11-1960	Voith	Siemens
Unit – IV	16-08-1963	Hitachi	Hitachi
Unit – V	03-11-1966	Hitachi	Hitachi

The plant got flooded in year 2019 due to which the need of immediate renovation was planned.

Our Brief Scope:

FLOVEL's scope includes the Renovation, Modernization and Uprating of the existing plant.

The units are to be operated as per following:

Unit	Capacity
Unit – I - III	25.81 MW
Unit – IV & V	24.19 MW

The scope covers all systems including:

» Turbines and Generators
» Electrical and Mechanical Balance of Plant (BoP)
» Civil, Hydro-mechanical, and Architectural Works
» Switchyard

Significance:

Gandhi Sagar HPS is very old and typical hydro plant having low head, low speed Francis Machine. In this plant the all units are not same or similar. While Unit I, II and III are similar; Unit IV and Unit V are different from each other and also from Unit I, II and III. Therefore, the work and approach have to be different as compared to other such standard Renovation projects. For Madhya Pradesh Power Generating Company Ltd (MPPGCL), Gandhisagar Hydro plant is first hydro plant for which complete renovation, modernization and uprating is taken up. It is also an honour for FLOVEL to be associated with Madhya Pradesh Power Generating Company Ltd (MPPGCL) in their first such endeavour.

NEW DYNAMICS

FLOVEL presents a new slogan and a revised visual appearance

Sustainability, innovation and a clear commitment to renewable energy – FLOVEL is starting a new era with a fresh brand identity. The recent relaunch of the visual appearance and the development of a new slogan symbolize not only FLOVEL's modernization but also its strengthened commitment to environmentally friendly energy production.

A logo that reflects our vision

The new logo has been impressing for many years with its clear, modern design language, which visually illustrates the power of water and the dynamics of energy production captures. So far, the focus has been on using the logo in several colors.

The new design reduces this color world to a white logo on blue background. This means FLOVEL is taking the path of a clear color scheme with the central color blue, which stands for the natural element water, but it also connects to other points of reference. In color psychology, blue is linked to philosophers and thinkers, symbolizing the ability to grasp complex connections with foresight. From a design perspective, blue is one of the most important colors in global business.

Driving force for a better course

Managing Director **Gautam Kar** emphasizes the importance of this step.

Our new brand identity underscores our vision of a service-oriented and sustainable future. The new slogan reflects our innovative strength, commitment and engagement. We aim to do more than just sell hydroelectric power plants and their components — we want to actively contribute to helping our customers build a successful future. This relaunch marks an important milestone on this journey.

The website is at the heart of FLOVEL's communication. With a fresh design, optimized navigation, and improved features, it offers an even better user experience. Whether on a desktop, tablet, or smartphone – the new website is more intuitive, faster, and provides all essential information at a glance.

The words of the new slogan highlight FLOVEL's role as a driving force for a more sustainable and successful future for all customers. The slogan expresses the commitment to actively providing, implementing, and supporting high-end solutions for the clients.

Moreover, the company is motivated to improve environmental standards and steer the course toward a more sustainable society. FLOVEL relies on innovative technologies and a service-oriented approach to deliver efficient solutions to the customers.

In a time when excellent customer service is no longer guaranteed, FLOVEL makes a strong statement: the entire team is always available for customers. With 24/7 service, FLOVEL recognizes the crucial role that reliability plays in daily operations. The dedicated team ensures that every request is handled quickly and efficiently – with management actively involved. At FLOVEL, it is a given that company leadership participates in customer support, ensuring personal consultation at the highest level. This approach builds trust and provides customers with the security they deserve. **Service orientation is, therefore, the core of the new slogans!**

Why a Relaunch?

The decision to redesign the brand identity was made in response to changing energy industry and society. FLOVEL aims to clearly communicate its commitment to the outside world. The modern design and strong slogan are intended to not only appeal to existing customers but also inspire new target groups. The design relaunch is more than just a visual update — it goes hand in hand with comprehensive modernization measures within the company. In recent months, FLOVEL has made significant investments to bring the production up to a future-oriented state of the art. Another key step toward the future is the consistent expansion of FLOVEL's digital infrastructure. By using smart technologies, the company not only optimizes the internal processes but also offer customers even more efficient services.

Positive Response and Outlook

Shortly after the introduction of the new logo and slogan, FLOVEL has already received positive feedback. Customers and partners praise the modern design and clear message. Internally, the new brand identity has brought fresh momentum and strengthened alignment with FLOVEL's values.

FLOVEL SERVICE:
RELIABLE. CONNECTED. ON SITE.

How FLOVEL ensures round-the-clock performance of hydropower plants – with personal commitment and digital expertise. When a hydropower plant goes online, it is a major milestone. But for FLOVEL, that is just the beginning. With 24/7 service, remote diagnostics, and a dedicated team of experts, FLOVEL stays right by its customers' side – worldwide.

Service with a system – and with people

At FLOVEL, service is not an add-on – it is a core part of the company's philosophy. For FLOVEL, a project does not end at commissioning; this marks the beginning of a long-term commitment. FLOVEL takes responsibility for the lifetime performance of every plant it builds. Its approach combines advanced technology, extensive experience, and a hands-on mindset to ensure reliable and sustainable operation over the entire lifecycle.

This includes regular maintenance, preventive inspections, and fast diagnostics – always delivered by a team that knows the plant inside and out. Many FLOVEL technicians were already on-site during commissioning. They understand the local conditions, know the challenges – and often have a long-standing working relationship with the customer.

> **Our goal is to ensure long-term performance, and that means staying close, staying available, and staying committed.**

FLOVEL technicians often stay involved long after commissioning – with deep knowledge and dedication.

24/7 availability – worldwide

At the heart of FLOVEL's service offering is true 24/7 availability. Customers do not get redirected to a call centre – they get access to real technical expertise. Whether it is a malfunction, a need for analysis, or urgent maintenance: FLOVEL's standby team is always ready – even at night or on weekends.

This commitment is supported by FLOVEL's central digital monitoring platform. It allows real-time remote supervision of all connected plants – securely encrypted and highly accurate. Many issues can be identified and solved before they ever affect operations. And if action is required, the right steps can be taken immediately.

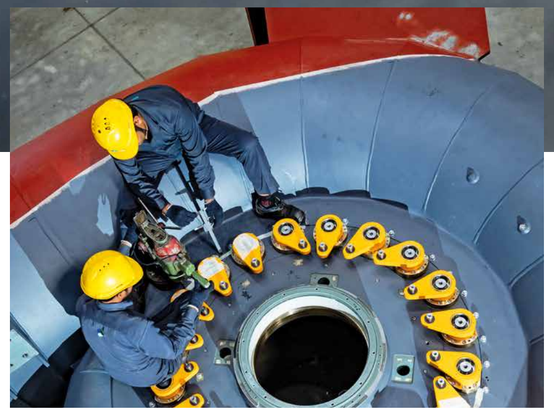
Digitally connected: looking into the plant without being there

Modern hydropower facilities are intelligent systems – and FLOVEL makes full use of this potential. With sensors, data analytics, and secure remote access, the company enables rapid diagnostics and continuous performance optimization. Software updates, control settings, and operational data can all be managed remotely – without anyone needing to be on-site.

This type of remote service has repeatedly helped prevent operational downtime at customer sites. Clients particularly value FLOVEL's combination of cutting-edge technology and direct expert support. Instead of automated responses, they benefit from personal contact with specialists who have in-depth knowledge of each individual plant and its specific requirements.

Live monitoring ensures real-time diagnostics – often before problems arise.

> **FLOVEL's remote services have saved us from costly downtime more than once.**



From Asia to South America – FLOVEL experts bring local understanding and global know-how.

Expertise that reaches the top

One of FLOVEL's unique strengths is the active involvement of senior management in projects and service operations. This close engagement ensures fast decision-making, pragmatic solutions and efficient processes without unnecessary bureaucracy.

Such a level of commitment is not always standard among international suppliers. FLOVEL's approach goes beyond technical support, fostering long-term partnerships built on trust, reliability, and mutual understanding.

A network of experience and know-how

FLOVEL draws on decades of hydropower experience and a team that has proven itself on projects around the globe. From South America to Asia and Europe, customers benefit from the expertise and commitment of FLOVEL's engineers and technicians.

In addition to strong technical capabilities, the team brings cultural awareness and flexibility to international assignments. This combination represents a significant advantage in the successful execution of global projects.

A partner that stays

From routine checks and troubleshooting to upgrading existing equipment: FLOVEL remains a trusted partner long after commissioning. With a unique combination of digital service, hands-on support, and deep industry understanding, the company ensures reliable hydropower – today, tomorrow, and for decades to come.

FLOVEL Service at a Glance

- 24/7 availability
- Global remote monitoring
- Preventive maintenance & inspection
- Fast response from experienced teams
- Involvement of senior management
- Customized support contracts

With FLOVEL's service commitment, your hydropower plant is in safe hands – today and for years to come.

More than

EFFICIENCY

Hydropower uses energy more efficiently than almost any other technology.

More output. Fewer losses. Maximum efficiency.

FLOVEL

Driving force for a better course

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