

flow05



Company Magazine September 2024



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EMBRACING CHANGE AND ELEVATING LEADERSHIP AT FLOVEL

In a dynamic business landscape, adaptability is key to sustained success. At FLOVEL, we are thrilled to announce significant changes in our leadership team this year, a strategic move to fortify our organization for the challenges and opportunities of tomorrow.

Mr. S D Sharma, Chief Operating Officer: With immense pleasure, we share the promotion of Mr. S D Sharma to the role of Chief Operating Officer. His rich experience and exemplary leadership will be instrumental in steering our Operations function and manufacturing to new heights.

Mr. Bhaskar Gupta, Director – Sales and Marketing: Recognizing dedication and contributions, we proudly welcome Mr. Bhaskar Gupta as the new Director - Sales and Marketing. His strategic vision and commitment have played a pivotal role in the growth of the Company.

Mr. S K Midha, Functional Head: In acknowledgment of outstanding dedication, Mr. S K Midha steps into the role of Functional Head, entrusted with leading the System Engineering and Erection & Commissioning departments.

These changes reflect our commitment to nurturing talent within our organization and strengthening our leadership pipeline. The revised organizational structure aligns with our vision for a more agile, vibrant and resilient future.

Our vision is to be a technology leader, and to be amongst the top Hydropower equipment manufacturers globally, by leveraging technological and commercial acumen, to exceed Customer expectation and to be the most respected brand.



from left to right:

Bhaskar Gupta
Director (Sales & Marketing)

Maharaj Kar
Executive Chairman

Gautam Kar
Managing Director

Sunil Dutt Sharma
Chief Operating Officer

**Never lose
the focus
on performance**

MANUFACTURING IN NEW DIMENSIONS

"Driving force for a better course" is the slogan that FLOVEL adheres to in every respect. This is also the case with the challenges that a fast-moving hydropower market brings with it. FLOVEL always wants to be one step ahead and pass this advantage on to its Customers.

The continuous development and expansion of FLOVEL's production is crucial to remain successful in the dynamic and competitive market. FLOVEL wants to give their Customers only the best and offer a very wide range of products and services. Renewable energies are becoming increasingly important, and it is necessary to constantly optimize technologies and production capacities to meet the growing demands.

Technical innovation plays a central role here. Advances in turbine and hydropower technology can significantly improve the efficiency and reliability of energy production. This includes the development of new materials, improved design concepts and advanced control systems that enable more precise and efficient use of water resources.

In addition, expanding production capacities is essential in order to realize larger projects. This calls for investments in modern production facilities and the training of specialists to drive technological progress in a sustainable manner.

These measures enable FLOVEL and their Customers to remain competitive, respond flexibly to new market requirements and make a significant contribution to the global energy transition.



We are prepared!

Always offering our Customers the best continually, presenting us with new challenges and investments. We face these challenges with courage and commitment and are always one step ahead.

Gautam Kar
Managing Director



Where excellence is made.

A short interview with Gautam Kar, Managing Director of FLOVEL Energy Private Limited.

Mr. Kar, what dimensions are being referred to when mentioning the expansion of FLOVEL's production area?

G. Kar: A new shed covering over 55,100 sq feet of additional manufacturing space with insulated PEB structure has doubled FLOVEL's production capacity. Addition of two shops under 60-ton (main) / 20-ton (aux) and 10-ton overhead cranes respectively will ensure that FLOVEL works with highest safety and provide quality material handling facility with reduced lead time, and does all critical operations inside the shop with controlled conditions and skilled people.

That sounds really big. Can you provide details about the new machines?

G. Kar: FLOVEL has added one big shot blasting booth which can take care of up to 8,500 mm jobs. The addition of a spray-painting booth makes sure to get the highest quality painting inside controlled conditions while taking care of the health of the people working inside with an efficient exhaust system. To get a step higher FLOVEL has installed a heating oven cum painting booth where the chamber can preheat and get the highest quality painting even under rainy atmosphere and coldest of the conditions. This facility takes FLOVEL to the next orbit painting quality and enhances the ability to fulfill the Customer commitment even in the worst climatic conditions. FLOVEL's assembly area is equipped with two jib cranes of 2-ton capacity which ensures that the people are handling small parts with comfort and accuracy thus efficient and tireless assembly operations.

Does one machine stand out in particular, Mr. Kar?

G. Kar: Yes, that's Sora Luce – probably the most efficient, modern, and versatile machine in the business with a complete cast body, latest CNC control features and ability to dampen machining vibrations has given a decisive edge to FLOVEL's manufacturing process. It is difficult to find a large component which can't be done with this technological marvel.

That sounds impressive, but how are such advancements balanced with environmental considerations?

G. Kar: While FLOVEL has added additional production space, all care has been taken to preserve Mother Nature. In FLOVEL's pursuit to do so a zero-discharge company with sewage water treatment plants and storm water recharge wells, which ensures that every single drop of water is recharged and reused, was made. The floor, the walls and the sealings are designed with the latest green building concept and good illumination levels across the working zones. All the electrical components installed in this shop are the most energy efficient as per the latest technology. To keep FLOVEL's factory green and reduce the carbon footprint Miyawaki gardens (Japanese concept for city forest) in the factory has been installed and close to 1,000 trees are planted.

Employees play a special role at FLOVEL. What part do they take up in the concept?

G. Kar: Of course, the new production has all safety systems, and the facilities are designed so that the health of the employees is not at risk. FLOVEL has made one of the most beautiful canteens for the employees where they can relax under serene conditions while having their delicious meals. The training room with a capacity for about 90 people and the latest smartboard will ensure high-quality training for employees and stakeholders. FLOVEL believes that enhancing knowledge is the keyway to enhance the Customer satisfaction.





Song Ma-3 HPP (29.5 MW)

Song Ma-3 HPP (2 x 14.75 MW) both were commissioned & synchronized with grid in two phases: Unit-1 on 6th September 2022 & Unit-2 on 19th January 2023. This project, owned by **M/s DONG A INVESTMENT AND CONSTRUCTION JOINT STOCK COMPANY** is FLOVEL's 35th commissioned project in Vietnam. This project is also special as this is our first Vertical Francis machine without Main Inlet Valve and is directly controlled by dam gates.

Scope of work included Design, Manufacturing and Supply (till project site) of Vertical Francis Turbines, Generators, Digital Governor, Power Transformer, Switchyard equipment and complete E-BOP & M-BOP equipment on water to wire basis. Services included complete erection, testing & commissioning. The smooth commissioning process and excellent operational parameters showcase FLOVEL's robust and reliable Design, Manufacturing and Project Management capabilities.

The project parameters are:

» Location: Phi Nhu Commune, Dien Bien Dong District, Dien Bien Province, Vietnam	» Type of water turbines: Vertical Francis
	» Installed Capacity: 2 x 14.75 MW
	» Rated Head: 54.74 m

Dak Ba HPP (30 MW)

The project was commissioned and synchronized to the grid (Both Unit 1 & 2 on 3rd Jan 2023) and the plant was handed over to Customer for commercial operation. Scope of work included Design, Manufacturing and Supply of Vertical Pelton Turbine, MIV, Generator, Digital Governor, complete E-BOP & M-BOP equipment on water to wire basis and supervision of erection, testing & commissioning.

Customer is extremely delighted with the performance of the machines and has applauded the execution efforts by FLOVEL team.

The project parameters are as follows:

» Client: BACH THIEN LOC JOINT STOCK COMPANY	» Type of water turbines: Vertical 6 Jet Pelton
» Location: Son Tay District, Quang Ngai Province, Vietnam	» Installed Capacity: 2 x 15.0 MW + 15% COL
	» Rated Head: 314.27 m



Suoi Linh HPP (5.2 MW)

Suoi Linh HPP (2 x 2.6 MW + 20% COL) situated in Lai Chau Province, Vietnam. Both units were commissioned and handed over to the Customer on 30th August 2023. This project, owned by **M/s SUOI LINH HYDROPOWER JOINT STOCK COMPANY** is FLOVEL's 37th commissioned project in Vietnam. With this total power generation capacity of FLOVEL in Vietnam reached 640.63 MW.

Scope of work included Design, Manufacturing and Supply (CIF Hai Phong port) of Horizontal Three Jet Pelton Turbines, Generators, Digital Governor, Power Transformer, Switchyard equipment and complete E-BOP & M-BOP equipment on water to wire basis. Services included Supervision of complete erection, testing & commissioning.

The project parameters are:

» Location: Tan Uyen Town, Tan Uyen District, Lai Chau Province, Vietnam	» Type of water turbines: Three Jet Horizontal Pelton
» Installed Capacity: 2 x 2.6 MW + 20% COL	» Rated Head: 207.22 m



Hakusui PPP (0.29 MW)

Hakusui PPP in Oita prefecture of Japan. This project was commissioned on March 10th, 2023. This marked our **third commissioned project in Japan market** after Omokawa PPP & Kumamoto PPP.

The scope included Design, manufacturing, supply, installation, testing & commissioning of Turbine and Main Inlet Valve. As per the specific requirement of Japanese Customer, we designed and incorporated electrically actuated servomotors for operation of Needles, Deflector & Main Inlet valve. It was exciting to meet stringent quality standards set by Japanese Customers.

The project parameters are:

» Location: Oita prefecture, Japan	» Rated Turbine Speed: 600 rpm
» Type of water turbines: Two Jet Horizontal Pelton	» Frequency: 60 Hz
» Installed Capacity: 1 x 0.29 MW + 4% COL	» Rated Net Head: 106.6 m

Chi Lu HPP (15 MW)

CHI LU HPP (2 x 7.5 MW + 10% COL) situated in Yen Bai Province, Vietnam was successfully commissioned & synchronized with grid on 22nd August 2023. The plant is handed over to Customer for commercial operation. This project, owned by **M/S YEN BAI POWER INVESTMENT AND DEVELOPMENT JOINT STOCK COMPANY** is FLOVEL's 38th commissioned project in Vietnam. Scope of work included Design, Manufacturing and Supply of Horizontal Francis Turbines, Generators, Digital Governor, Switchyard equipment and complete E-BOP & M-BOP equipment on water to wire basis. Services included Supervision of erection, testing & commissioning.

The project parameters are:

» Location: Hat 2 Hamlet, Hat Liu Commune, Tram Tau District, Yen Bai Province, Vietnam	» Type of water turbines: Horizontal Francis Turbine
» Installed Capacity: 2 x 7.5 MW + 10% COL	» Rated Head: 208.2 m



Sukarame MHPP (7.05 MW)

SUKARAME MHPP (2 x 3.52 MW + 8.5% COL) was synchronized with grid on 4th & 5th May 2023 (Unit wise). Reliability trial operation (72 Hours trial run) was successfully completed on 12th May 2023 and the plant is handed over to Customer for commercial operation. This project, owned by **TAMARIS HYDRO GROUP** is FLOVEL's 12th commissioned project in Indonesia. This project is also special as this is our seventh consecutive project executed for the same group of investors.

Scope of work included Design, Manufacturing and Supply of Horizontal Francis Turbine, Main Inlet Valve, Generator, Power Transformer, Digital Governor, and complete E-BOP & M-BOP equipment on water to wire basis. Services included Supervision of erection, testing & commissioning. Performance of FLOVEL. Quality of machinery was highly appreciated by Customer.



The project parameters are:

» Location: Batu Brak, Lampung, Barat Sub-District, Liwa Regency, Lampung Province, Indonesia	» Type of water turbines: Horizontal Francis
» Installed Capacity: 2 x 3.52 MW, max. Output: 3.82 MW	» Rated Head: 42.11 m

Nam Long HPP (9 MW)

Nam Long HPP (2 x 4.5 MW + 10% COL) situated in, Dak Nong Province, Vietnam, commissioned and handed over to the Customer on 2nd November 2023. This project, owned by **M/s DAK NONG POWER INVESTMENT AND MANAGEMENT JOINT STOCK COMPANY** is FLOVEL's 39th commissioned project in Vietnam. With this total power generation capacity of FLOVEL in Vietnam has reached 666 MW. Scope of work included Design, Manufacturing and Supply (CIF Ho Chi Minh Port, Vietnam) of Horizontal Francis Turbines, Generators, Digital Governor, Power Transformer, Switchyard equipment and complete E-BOP & M-BOP equipment on water to wire basis. Services included Supervision of complete erection, testing & commissioning.



The project parameters are:

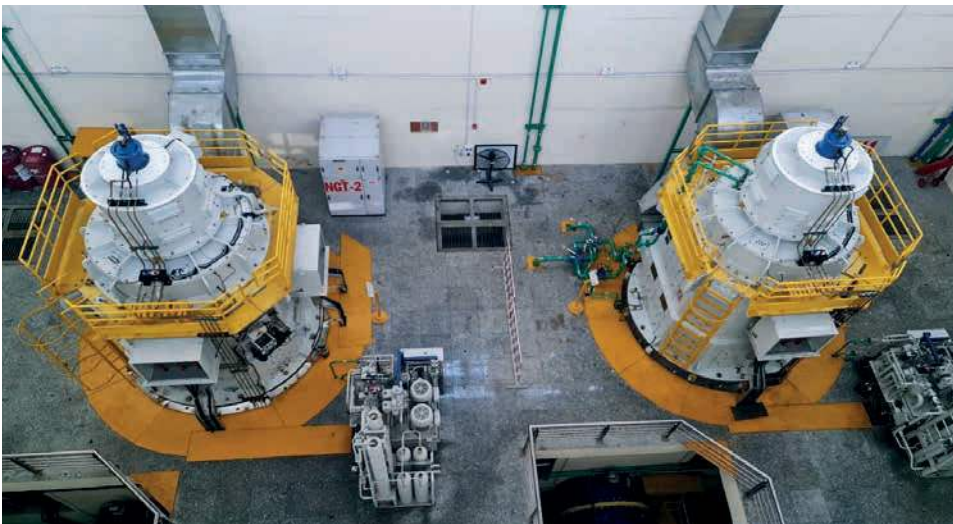
» Location: Nam Ha Village, Nam N'dir Commune, Krong No District, Dak Nong Province, Vietnam	» Type of water turbines: Horizontal Francis
	» Installed Capacity: 2 x 4.5 MW + 10% COL
	» Rated Head: 37.20 m

Dong Mit HPP (7 MW)

Dong Mit HPP (2 x 4.5 MW, including COL) situated in Binh Dinh Province, Vietnam was commissioned and handed over to the Customer on 10th January 2024. This project, owned by **M/s DONG MIT HYDROPOWER INVESTMENT AND CONSTRUCTION JOINT STOCK COMPANY** is FLOVEL's 40th commissioned project in Vietnam. With this total power generation capacity of FLOVEL in Vietnam has reached 675 MW. Scope of work included Design, Manufacturing and Supply of Vertical Full Kaplan Turbines, Generators, Digital Governor, Auxiliary Transformer, and complete E-BOP & M-BOP equipment on water to wire basis. Services included Supervision of complete erection, testing & commissioning.

The project parameters are:

» Location: Binh Dinh Province, Vietnam	» Installed Capacity: 2 x 4.5 MW
» Type of water turbines: Vertical Kaplan	» Rated Head: 37.0 m



Nam Nghe 1A HPP (10 MW)

The project was commissioned and synchronized to the grid (Both Unit 1 & 2 on 24th March 2023) and the plant was handed over to Customer for commercial operation. The Scope of work includes Design, Manufacturing and Supply of Horizontal Pelton Turbine, MIV, Generator, Digital Governor, complete E-BOP & M-BOP equipment on water to wire basis and supervision services of erection, testing & commissioning.

Customer is extremely delighted with the performance of the machines and has applauded the execution efforts by FLOVEL team.

The project parameters are:

» Client: NAM NGHE 1A HYDROPOWER INVESTMENT AND CONSTRUCTION JSC	» Type of water turbines: Horizontal 2 Jet Pelton
» Location: District Nam Nhun, Lai Chau Province, Vietnam	» Installed Capacity: 2 x 5.0 MW
	» Rated Head: 304.98 m

Upper Suri Khola HPP (7 MW)

The project was commissioned and synchronized to the grid (Both Unit 1 & 2 on 25th November 2023) and the plant was handed over to Customer for commercial operation.

The Scope of work includes Design, Manufacturing and Supply of Horizontal Pelton Turbine, MIV, Generator, Digital Governor, complete E-BOP & M-BOP equipment on water to wire basis and supervision services of erection, testing & commissioning.

The project parameters are:

» Client: MAKAR JITUMAYA SURI HYDROPOWER LTD, Kathmandu, Nepal	» Type of water turbines: Horizontal 2 Jet Pelton
» Location: Gaurishankar Rural Municipality, Dolakaha, Nepal	» Installed Capacity: 2 x 3.5 MW
	» Rated Head: 434.21 m



FLOVEL Energy's Malaysian Odyssey:

NAVIGATING CHALLENGES, SECURING SUCCESS

In the dynamic world of hydro power, FLOVEL Energy, hailing from the vibrant landscape of India, embarked on a unique journey that unfolded across borders. The adventure to explore a new territory began in 2018 when FLOVEL set its sights on the Malaysian Hydro market, bringing forth a story marked by resilience, dedication, and a commitment to excellence.

Opening doors to the Malaysian market, FLOVEL eagerly engaged with Independent Power Producers (IPPs), forging connections that hinted at promising collaborations. Although these initial encounters sparked interest and IPPs appeared keen to look into the offerings from FLOVEL, the global pandemic in 2020 threw a curveball with travel restrictions, momentarily stalling the pursuit of these opportunities. Undeterred by the challenges posed by the unprecedented times, FLOVEL weathered the storm, taking the downtime as a period for reflection and strategic planning. We re-initiated our efforts during 2nd half of 2021, when International travelled eased to normalcy.

In a move that highlights FLOVEL's global reach, a representative agreement was signed with Worldwide Power Sdn Bhd., during July, 2023 further solidifying the company's standing in the Malaysian market. This strategic partnership is set to open new doors, fostering innovation and sustainable energy solutions.

Fast forward to the brink of 2023, and FLOVEL has emerged victorious, clinching its first order from Uni10 Energy, a distinguished EPC Contractor for a significant hydro power project in Malaysia owned by WHB Group. This achievement underscores FLOVEL's unwavering commitment to delivering top-notch electro-mechanical equipment and services. FLOVEL's Scope of Supply & Services under this contract include Electromechanical Equipment for 2 x 2.25 MW Kerling Lower SHP, comprising of Horizontal 2 Jet Pelton Turbines at rated head of 246.7 m and rated speed of 600 rpm.

The journey from exploration in 2018 to securing a notable order in 2023 is a triumph for FLOVEL. The company's persistence, vision, and ability to navigate international markets, one after the other have led to a success story worth sharing, with entering into 15th Country.

As we shine a spotlight on this chapter in FLOVEL's story, we invite our stakeholders, partners, and the global community to join in the celebration. This success of expanding the Global footprints not only showcases our technical prowess but also emphasizes our commitment to contributing to the global shift towards sustainable energy. FLOVEL, fortified by its triumphs and unfazed by challenges, looks ahead to a future where it continues to be a leader in the hydro power sector, driving change and fostering collaborations that transcend borders.

FLOVEL enters in the 15th country

Contract agreement signing of SHP Kerling Lower, Malaysia



GREEN IDEA COMPLETED

Sustainability and environmental protection are of central importance for industrial manufacturing companies in order to overcome the ecological, social and economic challenges of our time. In the face of climate change and increasing resource scarcity, companies must rethink their production processes and integrate sustainable practices. This starts with reducing emissions and waste, extends to the efficient use of resources and energy and the development of sustainable products to the creation of sustainable work areas and production facilities.

A sustainable approach helps protect the environment and helps preserve biodiversity. On the other hand, it increases competitiveness because business partners increasingly pay attention to environmentally conscious actions. In the long term, companies can reduce costs through sustainable measures, for example through lower energy consumption or waste reduction, and strengthen their reputation.

For FLOVEL, integrating sustainability and environmental protection into industrial processes is not only a moral obligation but also an economic success factor that contributes to securing its own future viability.

» While FLOVEL has added additional manufacturing area, the company has taken all the care to preserve Mother Nature. In the pursuit to do so FLOVEL has made a zero-discharge company with sewage water treatment plants and storm water recharge wells which ensures that every single drop of water is recharged and reused.

» To keep the factory green and reduce the carbon footprint FLOVEL has installed Miyawaki gardens (Japanese concept for city forest) in the factory planting close to 1,000 trees. The trees are waiting for a huge number of birds and butterflies as these trees grow to make a mini forest and make all employees feel happier when they are out for breaks looking around the factory premises. The idea is the employees go back recharged with fresh air and with a revitalized mind post break time.

» The floor, the walls and the sealings are designed with the latest green building concept and good illumination levels across the working zones. All the electrical components installed in this shop are the most energy efficient as per the latest technology.



Enthusiastic employees who drive our “Green Idea” forward.



Driving force for a better course

This slogan for FLOVEL means not only providing Customers with quality, expertise, and commitment but also serving as the basis for forward-thinking and sustainable practices that protect and improve Mother Earth.



Photovoltaics as the basis for resource-saving use of energy and a modern canteen in which employees can also enjoy vegetables that were partly planted on the company premises.

Koyna Stage II units:

FLOVEL has secured an order in 2023 with **MAHARASHTRA STATE POWER GENERATION CO. LTD (MAHAGENCO)**, a reputed state-owned utility in India having installed capacity of more than 12,000 MW in the state of Maharashtra. Order involves supply of two (2) nos. fully forged 6 Jet Pelton Runners for unit capacity 82 MW each for Koyna Stage II Renovation Project. Koyna HEP complex being a very prestigious scheme comprises of four dams with 16 units installed of various capacities. The total installed capacity at Koyna HEP complex is 1,960 MW. This order has further enhanced FLOVEL's wavelength in the Pelton Zone with previous highest unit capacity being 50 MW. The order was bagged via a competitive bidding process facing tough competition from major players. Key Highlights are as below. The Runners shall be manufactured by FLOVEL's State of the art technology.



The project parameters are as follows:

» Customer: MAHAGENCO	» Rated /Runaway speed: 375/690 rpm
» Type of Turbines: 2 6-Jet Pelton Runners	» Finished Weight: 9.55 tons
» PCD/External dia.: 2,340/3,011.4 mm	» Installed Capacity: 4 x 80 MW
	» Rated Head: 490 m



KABELI-A (37.6 MW), April 2023:

Kabeli-A HPP (3 x 12.533 MW + 10% COL) is our **22nd project in Nepal** stamping our best equipment, services and after sales support in Nepal. The group owner has completed many hydro power projects in the past.

The project parameters are as follows:

» Customer: KABELI ENERGY LIMITED	» Type of Turbine: Horizontal Francis
» Location: Panchthar District, Koshi Province, Nepal	» Installed Capacity: 3 x 12.5 MW + 10% COL
	» Rated Head: 115.28 m

ORDERS RECEIVED

Suchhu HPP (18 MW), May 2023:

This Project is being developed by Druk Hydro Energy Limited (DHyE) which is a 100% subsidiary of Druk Green Power Corporation Limited (DGPC) and is engaged in the business of generation of electricity in Bhutan. This is our **first project in Bhutan** and with this we have entered a new territory.

The project parameters are as follows:

» Customer: DRUK HYDRO ENERGY LIMITED	» Type of Turbine: 3-Jet Horizontal Pelton
» Location: Haa Dzongkhag District, Bhutan	» Installed Capacity: 2 x 9.0 MW
	» Rated Head: 273.00 m



Song Giang 1 HPP (12 MW), September 2023:

The project is being developed by Song Giang Hydropower Joint Stock Company. Main Investor is Singapore based Nexif Ratch Energy Group, who are developers of renewable energy in various South-East Asian countries. The completion time of this project is scheduled towards the end of the year 2024, **which is a fast-paced timeline**. It is our second project in the Khanh Hoa province, Vietnam.

The project parameters are as follows:

» Customer: SONG GIANG HYDRO-POWER JOINT STOCK COMPANY	» Type of Turbine: Horizontal Francis
» Location: Khanh Hoa Province, Vietnam	» Installed Capacity: 2 x 6.0 MW + 10% COL
	» Rated Head: 120.82 m



Kambangan HEPP (4 MW), October 2023:

The Kambangan Hydro Electric Power Project represents our second endeavor in the province of central Java. This Project is owned by a construction business group, PT. Bangun Tjipta Sarana. Bangun Tjipta Sarana is serving the construction industry in Indonesia with the building of high-rise skyscrapers, office buildings, harbour piers, dams, irrigation structures, bridges, roads and other civil engineering works. Kambangan HEPP is **our 13th project in Indonesia**. All 12 projects are under operation adding more than 70 MW green energy to the Indonesian Grid.

The project parameters are as follows:

» Customer: PT. INDO TIRTA BUANA	» Type of Turbine: Horizontal Francis
» Location: Central Java Province, Indonesia	» Installed Capacity: 2 x 2.0 MW
	» Rated Head: 86.00 m

Hidi Khola HPP (6.82 MW), December 2023:

We are glad to announce that we have been awarded again a high project i.e. Hidi Khola HPP with Net head of 697.50 m. It is our second high project in Nepal and **22nd project in overall in Nepal**. This project is being developed by White Lotus Power Limited, Nepal and is in Marsyangdi Gaunpalika in Lamjung district in Nepal. It is 220 km far from Kathmandu towards west direction at an elevation of 1,740 m masl. Along with high net head, it is a high-altitude project also which again demands special expertise.



The project parameters are as follows:

» Customer: WHITE LOTUS POWER LIMITED, Nepal	» Type of Turbine: 2-Jet Horizontal Pelton
» Location: Marsyangdi Gaunpalika, Lamjung district, Nepal	» Installed Capacity: 2 x 3.4 MW
	» Rated Head: 697.50 m

Nam Pan 5 HPP (28 MW), February 2024:

This is our **60th Project in Vietnam**. Nam Pan 5 project is located in Son La Province (our 8th Project in this province), 30 kms from Nam Chien 2.



The project parameters are as follows:

» Customer: GLOBAL PETRO POWER JOINT STOCK COMPANY	» Type of Turbine: Horizontal Francis
» Location: Muong Bu commune, Muong La district, Son La province, Vietnam	» Installed Capacity: 2 x 14.0 MW
	» Rated Head: 233.20 m

Upper Tadi HPP (11 MW), November 2023:

It is our second project from the same Customer in which we have added our vast experience from already executed many vertical machines in other part of the world. It's equipped with 6 Vertical Pelton Turbines. It is **our 23rd Project in Nepal**. Being a repeat order from the prominent and renowned hydro developer in Nepal, it is again an assurance for our new Customer which will give them better confidence on our highly efficient equipment, on time delivery, flawless execution and diligent after sales support in their home country.



The project parameters are as follows:

» Customer: SURYAKUNDA HYDRO ELECTRIC LIMITED	» Type of Turbine: 6-Jet Vertical Pelton
» Location: Nuwakot district, Nepal	» Installed Capacity: 11.0 MW + 10% COL
	» Site Altitude: 1,282 m masl
	» Net Head: 208.08 m



SHP Kerling Lower (4.5 MW), December 2023:

This marks **our inaugural project in Malaysia** which is being developed by Worldwide Hydro Energy Three Sdn Bhd (WHE3). WHE3's parent company, Worldwide Holding Berhad (WHB), operates in diverse sectors such as property, environmental management services, medical device manufacturing, energy, and green technology. This Contract is through Uni10 Energy, who are the established EPCC Contractors based in Kuala Lumpur, Malaysia. The projected completion date is set for end of 2025.

The project parameters are as follows:

» Customer: UNI10 ENERGY SDN. BHD.	» Type of Turbine: 2-Jet Horizontal Pelton
» Location: Hulu Selangor Province, Malaysia	» Installed Capacity: 2 x 2.25 MW + 10% COL
	» Rated Head: 246.75 m



Chinki HPP (25 MW), February 2024:

Chinki HPP with capacity 4 x 6.25 MW + 10% COL have been secured from RVR Projects Private Limited, Visakhapatnam, who are the EPC Contractor for this Multipurpose Irrigation Project. Project Developer is Narmada Valley Development Authority, Bhopal, a Nodal agency of Madhya Pradesh Government. The Project is located in District Narsinghpur, Madhya Pradesh.

The project parameters are as follows:

» Customer: RVR PROJECTS PRIVATE LIMITED, Visakhapatnam	» Type of Turbine: S-type Axial Flow
» Location: District Narsinghpur, Madhya Pradesh	» Installed Capacity: 4 x 6.25 MW + 10% COL
	» Rated Head: 15.25 m

DIGITAL INTELLIGENCE ECOSYSTEM

Advance Digitalization solution for Hydropower plants.

Digitalization has been a revolutionary step towards man and machine interface. The need of digitalization rise from several years and today it becomes a need of all the critical and beneficiary processes. Many giant industrial software developers come up with their solutions on digitalization. The scaling of their solution is lying between single conventional software. Their heavily loaded library and size of the components in those solutions is typically difficult to maintain for one process. Such solutions designed in the way to fit on all the industrial requirements from Solar, Hydro, and Nuclear to other process industries, which makes it hard to maintain the updated system for a particular section.

As they say "Put your-self in someone's shoes", this is what FLOVEL believe when it comes to the Customer requirements, benefits and Advantage on their side. All we have is one question, why do we need to keep our digitalization system updated if there is a change in other parent component?

Here FLOVEL came up with iNDUS solution to tackle the problem and providing a single platform solution for all the needs of control, monitoring, alarm management & historical events in a specific plant.

iNDUS is dedicatedly designed to meet the needs of hydro projects with various in built modules to provide services at various sub segments of plant control and monitoring. Its modules are categorized in five independent segments as:

1. **iNDUS Core – Digital Governor System**
2. **iNDUS Pro – SCADA System**
3. **iNDUS View – Remote Monitoring**
4. **iNDUS GW – Gateway for Load Dispatch Centre Communication**
5. **iNDUS Desk – Remote Commissioning & Maintenance**

Each of the modules is designed in a way that can work independently without any dependencies on other modules.

1. iNDUS Core:

Governor is the heart of turbine, which control its auxiliary system, speed and power. iNDUS provides a dedicated software solution for the turbine governor program, control and monitoring. It provides various functionalities like Speed Regulation, Island Operation, Position Mode, Power Mode, Level Mode, Droop Mode & Communication with central station. As very user friendly operator interface provides easy access to rich functionalities of governor system.

2. iNDUS Pro:

It provides a fully customized SCADA system for plant needs. It supports latest communications protocols including Modbus, DNP, IEC-60870-104, IEC-61850 (Ed1 & 2) etc. It also provides rich data storage and visualization features, with reporting and alarm managements.

3. iNDUS View:

Monitoring of plant from any corner of the world is need of today's life. iNDUS view provides Remote Monitoring feature which includes large data, health checks & site events. It also provides report notifications via emails & SMS.

4. iNDUS GW:

Communication of plant with Load Dispatch Center (LDC) is essential part for today's digitalized grid system. It plays an important role when grid stability and regulation needs to be maintained. iNDUS GW provides latest communications protocol to setup the connectivity of plant with LDC & provides latest data updates as required.

5. iNDUS Desk:

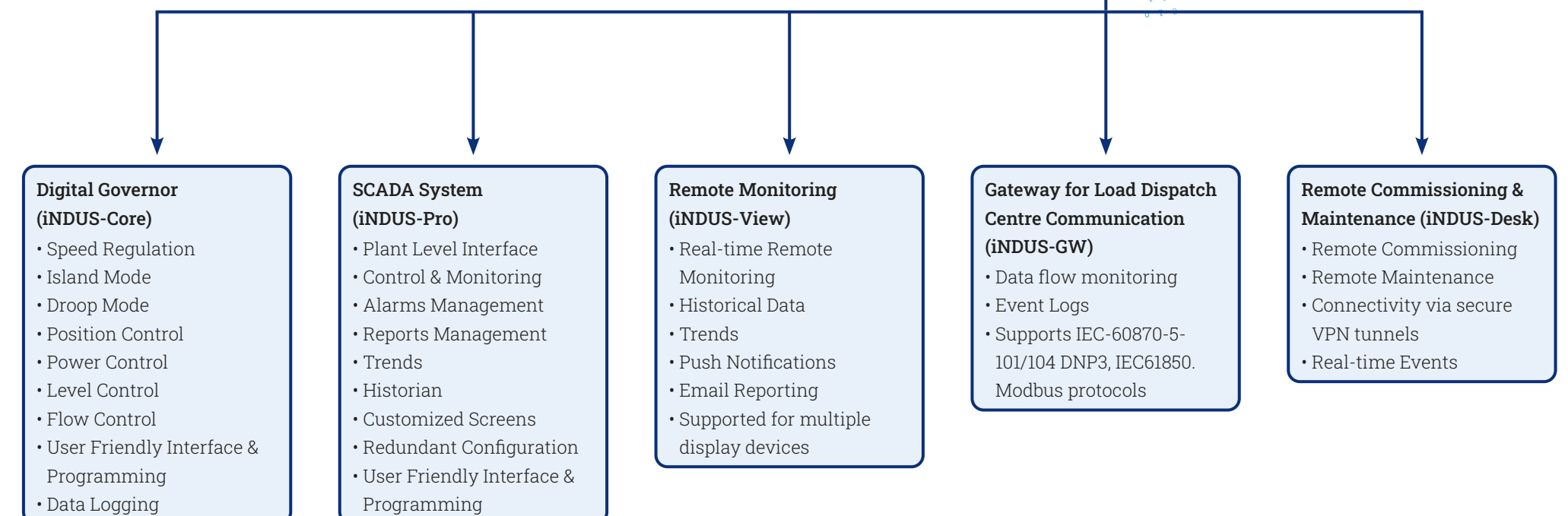
It is very important to provide a support at any instance of time for a trouble free operation. iNDUS solution is equipped with secured VPN tunnel to provide Remote Maintenance features on the request of site team. A specific site generated password needs to be shared by the site team to allow iNDUS desk for any Remote Support.

iNDUS solution has been running successfully at various sites & continuing evaluating further benefits to Customer. As Thomas Edison once said:

**“There's a way to do it better.
Find it.”**

What is iNDUS?

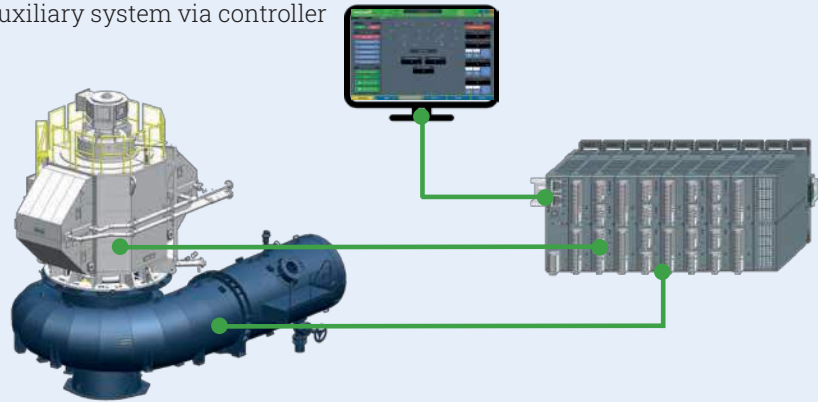
- Automation ecosystem developed in-house by FLOVEL
- One stop solution specifically designed for hydro power plants
- No unused resources
- Single solution for Non-Redundant & Redundant applications
- Easy integration, operation and maintenance
- User friendly operation and programming interfaces
- Supports Remote Monitoring, Commissioning & Maintenance



iNDUS Core: Digital Governor System

Hardware

- Digital governor is connected to field auxiliary system via controller

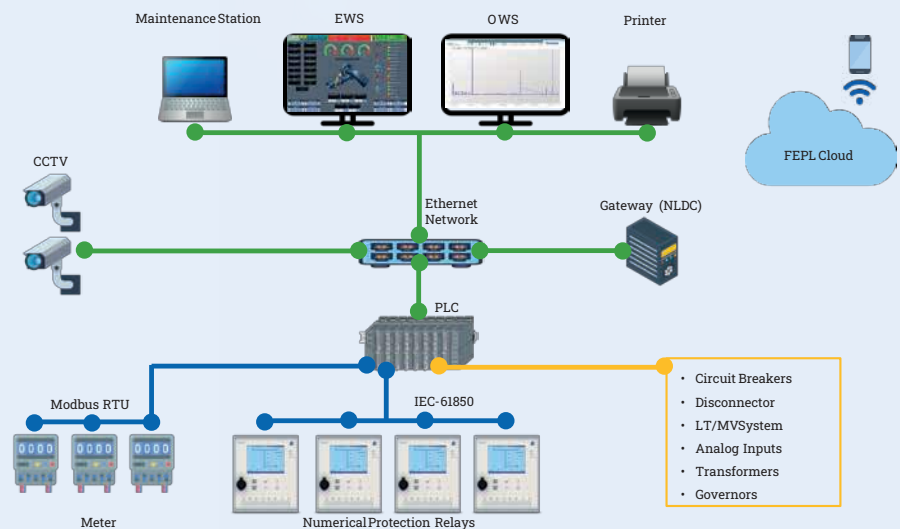


Software

- Control algorithms, backend software and configuration tool are developed in-house by FLOVEL.
- It provides very user friendly environment for programming, operation and troubleshooting of Governor system.
- No expertise is needed for PLC logic development, hence commissioning of the system is fast.
- Governor system can be programmed with certain user selection.
- Backup can be easily exported and imported using configuration tool.

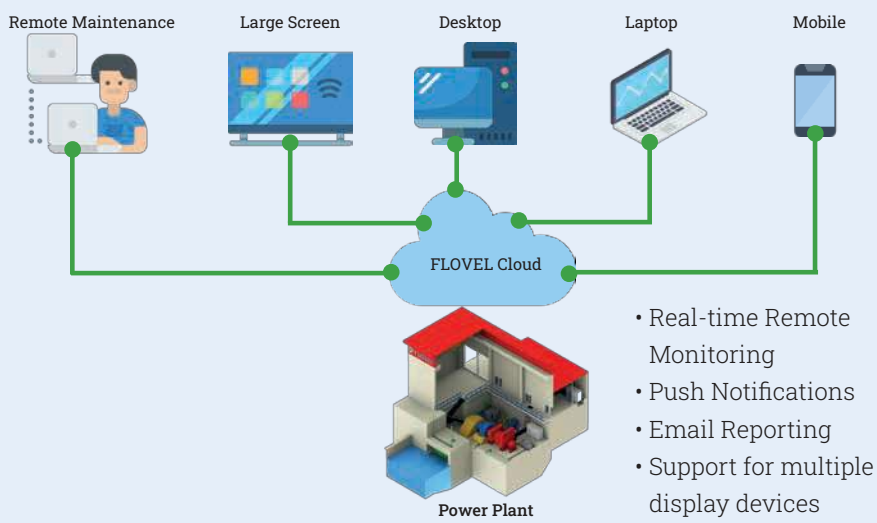


iNDUS Pro: SCADA System

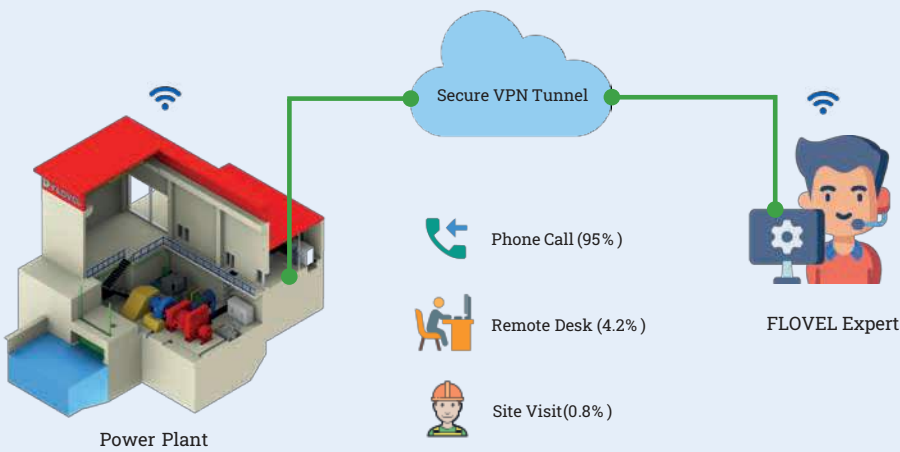


- It supports latest industrial protocols as:
 - IEC-61850 (Edition1-2)
 - IEC-60870-5-101/103/104
 - Modbus RTU/TCP-IP
 - DNP3.0
- Rest API Integration
- Historian for 10 years
- User defined format for reporting
- Alarm management system
- Protected access for data/parameters setup
- Customized graphics screen for data monitoring

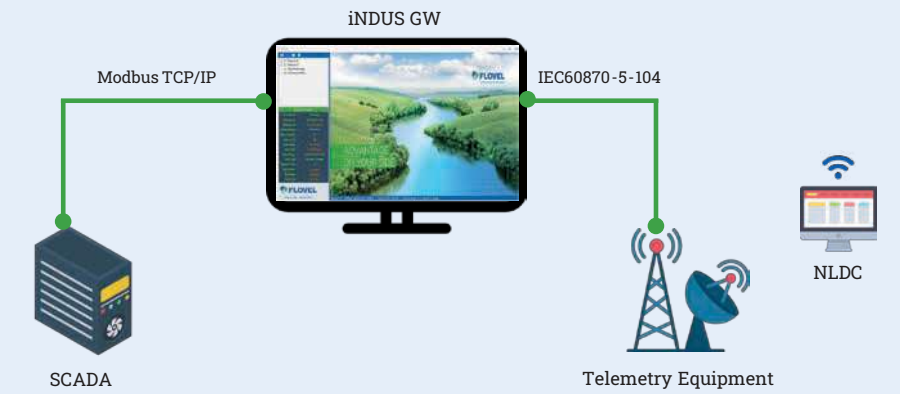
iNDUS View: Remote Monitoring



iNDUS Desk: Remote Commissioning & Maintenance



iNDUS GW: Gateway for Load Despatch Centre Communication



- It supports IEC-60870-5-104 protocol for communication between plant and load dispatch centre
- Configurable for two independent load dispatch centres connected to the same plant
- Provides redundant communication
- Easy to diagnose
- Totally customized and project oriented solution
- Displays real time data transmission to and from load dispatch
- Advanced feature allows blocking external peripheral devices interface with gateway
- Data transmission with time stamping
- Excel based configuration

Machine learning

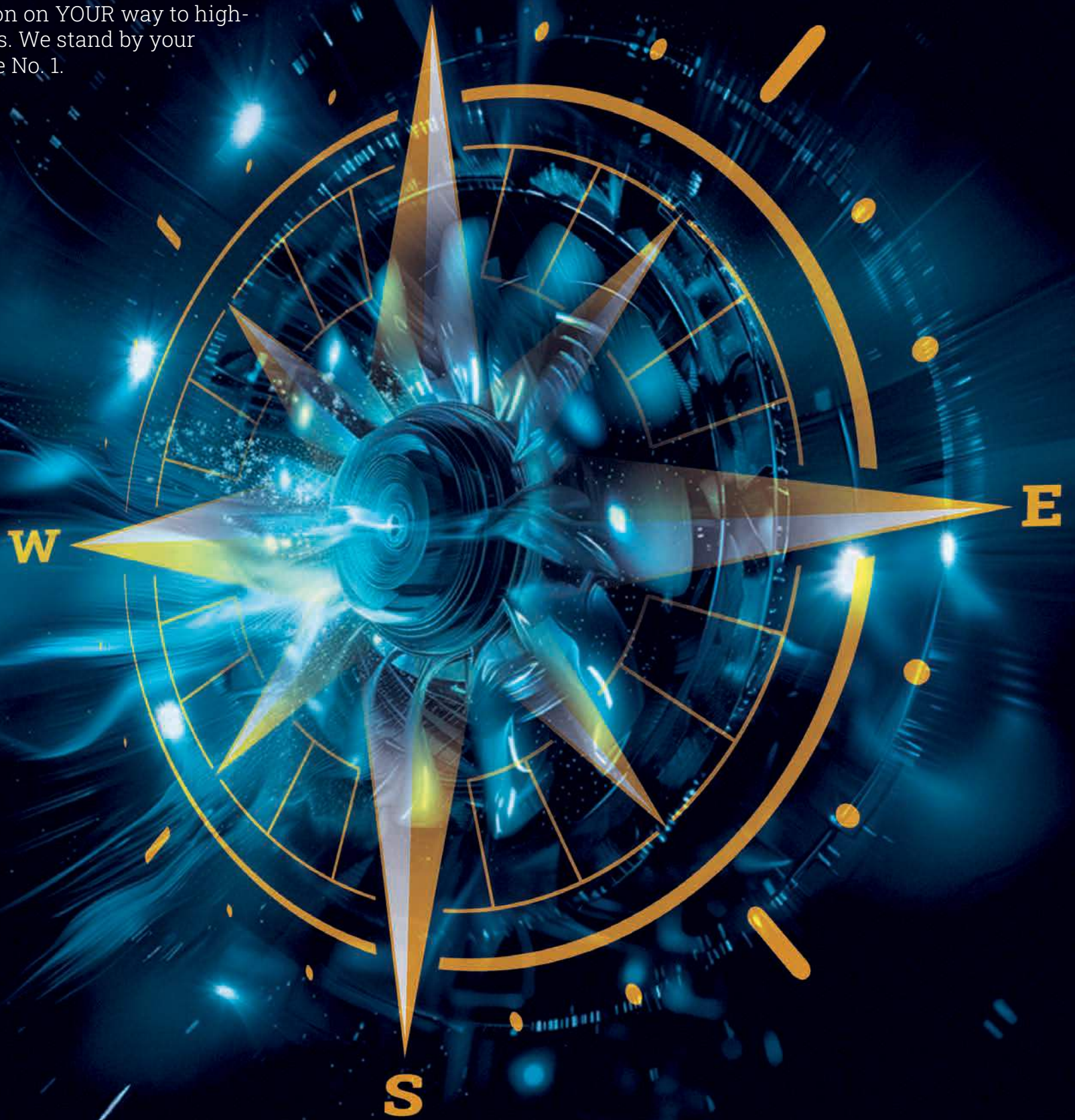
Machine learning is a component of artificial intelligence (AI). It focuses on teaching computers to learn from data, experiences, and machine behavior in order to improve. The processes become more accurate with use and as more data becomes available. It can be used to detect patterns, predict outcomes, make critical decisions, and respond more quickly if issues arise. iNDUS will analyze operational patterns under various conditions, including water levels, ambient temperature, load, and auxiliary conditioning. Based on this analysis, it will predict operating conditions and issue alerts if any abnormalities are detected.



DRIVING FORCE FOR A BETTER COURSE

Many paths lead to the goal. But in hydropower business it is very important to choose the most effective one. FLOVEL is THE companion on YOUR way to high-end hydropower solutions. We stand by your side and help you become No. 1.

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Driving force for a better course

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