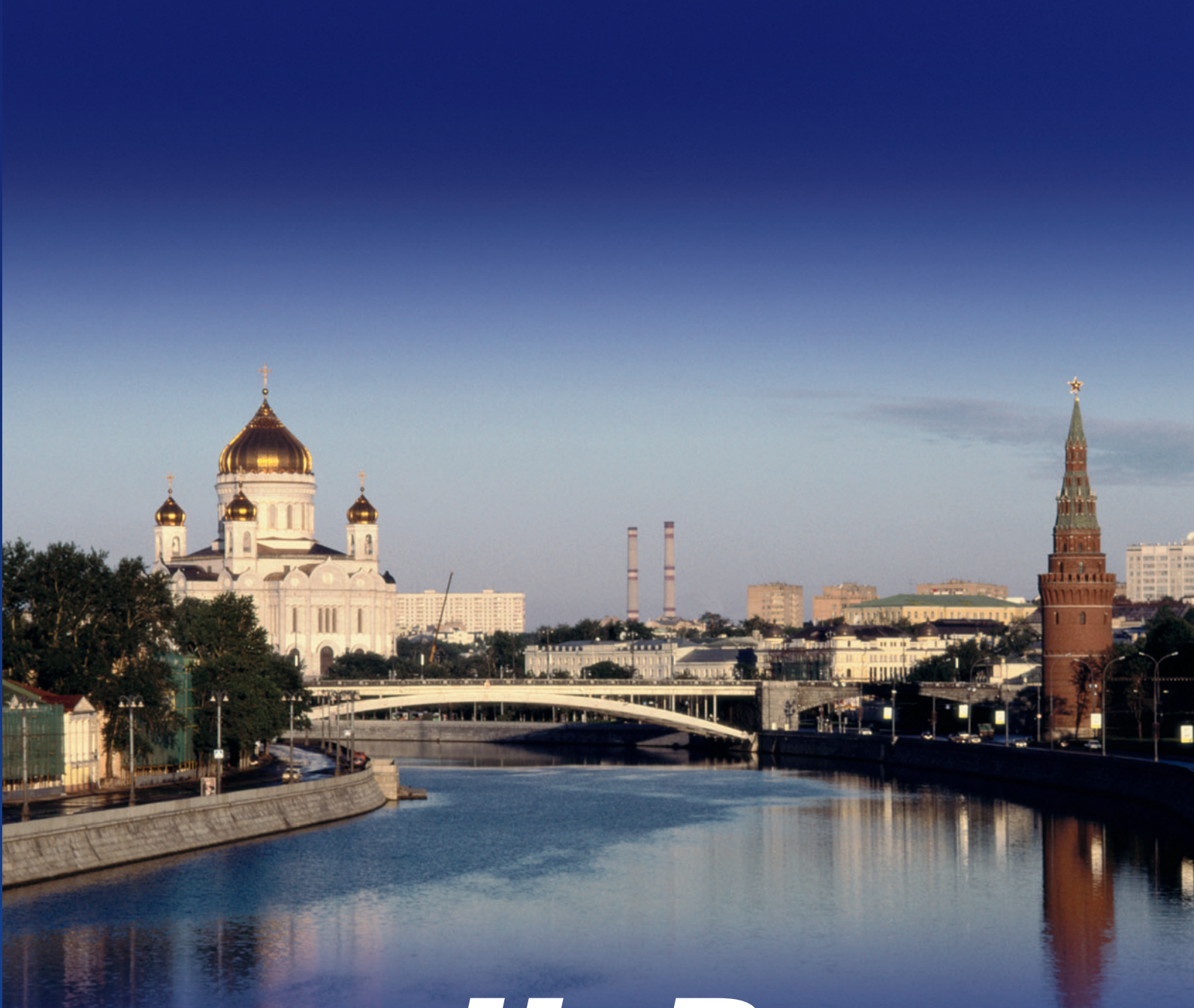


HyPower

Customers magazine for Voith Siemens Hydro

7

March 2004

Summary

Editorial

Voith Siemens Hydro Power Generation

The sustainable approach in hydro business

Dr. Hubert Lienhard
Chairman of the Board of Voith Siemens Hydro Power Generation

Dear readers, dear customers,

If somebody asked: "Where are the big hydro markets for the future?" the likely answer would be: "China, India, and in the not too distant future, Brazil, again."

Wouldn't it be nice to simply focus on these markets or wait for some of them to come back? China and India certainly have the most concrete energy development plans with big shares in new hydro. India is just announcing a 50,000 MW hydro program. And, of course, we are proud to be a partner in this development through our presence there. Brazil may be expected to soon offer opportunities for the new and rehab hydro business again.

In other areas of the world, however, this comeback or new development of hydro is not so clear and forecastable. If you look, for example, at the regions of the former Soviet Republics and Eastern European countries, overall development in their economies is difficult. Despite the fact that these countries very often have substantial hydropower installations in abundance, capital investment is low for hydro development.

How can we sustain new or spark redevelopment in areas like this? How can we help hydro as the most mature renewable and sustainable "fuel" in the energy mix of these countries?

Hydro investments have always been slow in coming; they are large capital projects with long life-cycles of 50 years and more, with high upfront costs. For short-term planning the return on investment of these projects is not spectacularly high. Still, we believe that we can have a sustainable approach to this market, as evidenced in the articles in this issue, showcasing the roles we play in the development of Russia, Armenia, Bulgaria and also Afghanistan, are just the beginning. What we have to offer in this issue are examples of our patience and sustainability in this business. Another fine example of long-term efforts comes from India. After many years, the Shrinagar hydro project in India is ready for development. Through our U.S. developer company, Synergics, all commercial aspects of project development have been completed and we have arrived at the phase where Tata Power has taken over as our national partner.

We have the technology, the business platform, the financial background and the expertise to get the job done.

We look forward to working with you to protect and further develop this most precious resource.

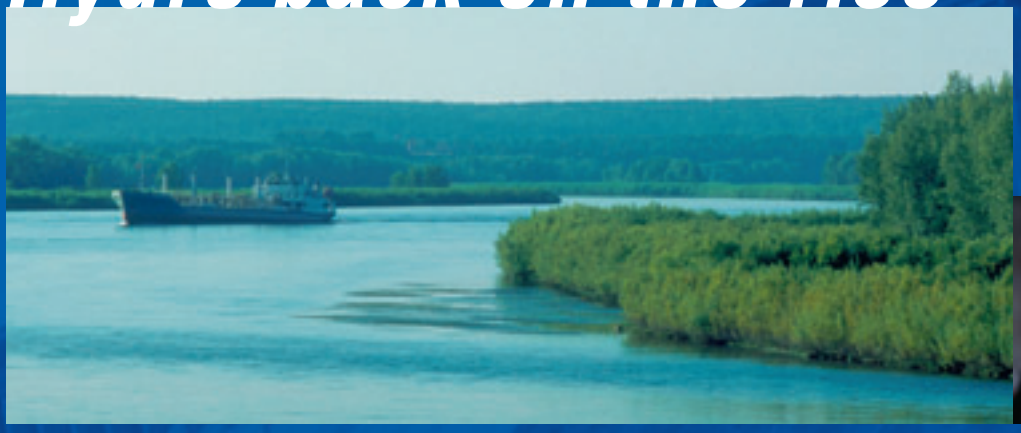
We are interested in your opinions and comments, please feel free to direct them to me personally.

Yours sincerely

Dr. Hubert Lienhard

My e-mail address is Hubert.Lienhard@vs-hydro.com

Hydro back on the rise



Russia's giant power sector has a total electricity generation capacity of more than 200 GW and in 2001 generated approximately 846.5 billion KWh of energy. After the collapse of the Soviet Union, electricity generation declined dramatically between 1992 and 1999, but since then has gradually recovered. The power industry of the biggest country on earth includes 440 thermal and hydropower plants and 30 nuclear power plants.

Hydro power plays an important role in the country's electricity supply. According to recent statistics of the government-owned Unified Energy Systems (UES), approximately 44 GW come from hydro, representing 21.5% of Russia's total installed capacity.

Typical of the Russian power industry is the use of large-capacity generating units.

The largest hydroelectric stations in Russia are the Sayano-Shushenskaya station (6,400 MW), the Krasnoyarsk station (6,000 MW), and the Bratsk station (4,100 MW).

The economic recovery after the August 1998 financial crisis resulted in an increase in the country's total electricity consumption, and has forced power stations to operate at higher capacities. This has brought hydropower plants into sharper focus since they do not depend on fossil fuels.

The Russian government has stated that it intends to expand the role of nuclear and hydro power in the future. Particularly in Siberia and the country's far east, where electricity supply can be problematic, the government has made hydroelectric generation a priority.

Russia's giant Bratsk station – modernization

When completed in 1961 after 7 years of construction, the Bratsk hydropower plant with its total output of 4,100 MW was the largest hydropower station in the world. Today, it still ranks among the largest and most important hydropower stations in Russia. Located on the Angara River in Siberia, it supplies the city of Bratsk and its giant aluminum smelter with electric power.

In January 2001, a contract to modernize the first two governors of Bratsk was awarded to Voith Siemens Hydro. Nine months later, the first governor was commissioned and a comprehensive training of the customer's personnel took place.

Orders to deliver and commission new governors, adapt control valves and equipment for oil purification for additional units have followed. To date, eight of 18 units have been equipped with Voith Siemens Hydro technology and are operating successfully.

A joint control system for power, frequency and voltage regulation was ordered at the end of last year. Since the 18 units at Bratsk are working on three different bus bars, interconnected by transformers, this contract poses a certain challenge for Voith Siemens Hydro engineers. They will have to find a solution to control not just the total powerhouse output, but also the balance between the bus bars. A challenge they are eager to face: the joint control system will be commissioned this year. The complete modernization process is scheduled to be finished by 2006.

For more information:
Robert.Doppler@vs-hydro.com

Voith Moscow office

Since 1990, Voith Siemens Hydro has been active in Russia, where Voith AG established an office in the country's capital, Moscow. The office is situated in the heart of the city, close to the Sukharevskaya metro station and occupies the first floor of the 19th century building at Boulevard Sucharevsky. In February 2003, Jaroslav Novikov, was named the company's representative for all hydro activities in Russia.

Address

Voith Siemens Hydro,
Moscow Office,
B. Sucharevsky per 26, B.1,
127051 Moscow, RF
Tel. +7 95 208 94 64
Fax +7 95 208 97 41
For more information:
jaroslav.novikov@voithmoscow.ru

Bulgarian hydro potential supporting energy export

Bulgaria's energy sector is dominated by nuclear power and imported fossil fuels. The energy balance for the country shows that more than 70% of energy consumption is based upon imported fuels. Hydro power accounts for only 6-7% of all electricity generation.

Despite a very large potential for future expansion, Bulgaria's hydro-electric resource utilization can only be described as modest. However, as electricity production still exceeds demand after the decline of energy-intensive industry branches of the former COMECON area, future hydro development will come as a result of energy exports to Bulgaria's neighboring countries.

In 1999, the total output of the country's hydro plants was 2,979 GWh, of which 351 GWh were consumed in pumping mode. The 14 largest plants operate in four cascades, generating power to meet peak demand and provide system regulation. These four cascades are: the Belmeken-Sestrimo-Chaira, Batak, Arda in the Rhodopes mountains, and the Dospat-Vacha cascade in the Rila Mountains.

Modernization of all Rila cascade stations

After almost eighty years of successful operation, Granitoid, the owner of the oldest hydropower cascade in Bulgaria, has entrusted Voith Siemens Hydro with a major modernization of the project. In February, a frame contract for modernization comprising new mechanical equipment, electrical balance of plant systems as well as a state-of-the-art automation system, was signed by Granitoid and Voith Siemens Hydro.

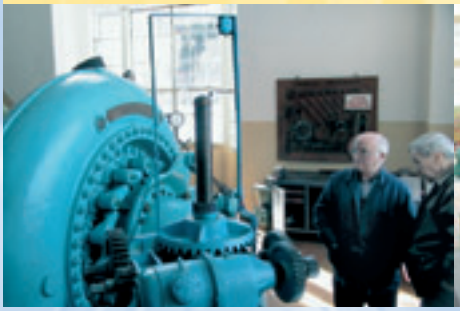
As early as February 1925, the first generating unit of the cascade, a Voith Francis turbine with a rated output of 2.4 MW, had been commissioned and put into service at Pastra hydropower station. Pastra is the oldest within a cascade of four hydro plants in the Rila mountains, which are the highest on the Balkan peninsula.

The Rila hydropower station, also mainly Voith equipped, produces the highest power and began operation in 1928, followed by the generating stations of Kamenitsa in 1940 and Kalin in 1948.

In March 2003, Granitoid awarded Voith Siemens Hydro the contract for the design and supply of a hydraulically optimized runner with increased efficiency for its oldest plant, Pastra 1.

In a second step, after positive experience gained during project execution of Pastra 1, Granitoid scheduled upgrades for the whole cascade. Again, Voith Siemens Hydro was selected by Granitoid to perform the work, including a range of new runners, new wicket gates and turbine shaft seals as well as the rehabilitation of other mechanical components to ensure a proper interface with the new equipment. Another important focus of the modernization is on automation. The contract scope also includes the supply of new turbine governors, control systems, low-voltage switch gear, static excitation and electrical protection for all seven units, all four power plants and the cascade dispatch center located in Rila. Granitoid plans to release rehabilitation work unit by unit from the frame contract on the basis of modernizing one unit per year.

For more information:
Raimund.Gabriel@vs-hydro.com



Armenia – hydro power as a key to future development

Following a severe economic decline in the early 1990s, Armenia today is continuing its recovery. Small- and medium-sized enterprises, most of which have already been privatized, have spurred continuing economic growth. Armenia's real gross domestic product grew by approximately 6% in 2003.

In order to improve infrastructure conditions, an appropriate minimum supply of electrical energy to business and private households is crucial. Approximately one fifth of the energy generated in the country is derived from hydro power. Armenia's hydropower potential is huge, but currently only a small part of this single major native energy source is exploited.

The capacity of all hydropower plants installed in the country is a little more than 1,000 MW. The improved utilization of hydro power is one of the government's objectives, in order to achieve greater independence from energy and fuel imports in the future. It is to play a key role in the development of this Middle East republic.

Modernization of the Vorotan cascade

After 33 years of service, the availability of the generating facilities at one of the largest hydropower cascades in Armenia has fallen clearly below the original values. Highest priority rehabilitation measures are now to be carried out.

The Vorotan cascade, extending 178 km along the Vorotan River, consists of three power plants with a total installed capacity of 404 MW. Tatev power station with its three Pelton turbines of 52.4 MW each is the most important of these generating facilities.

Although designed as peak-load plant, Tatev is currently the only station permanently operated in active grid regulation mode. Originally commissioned in 1970, its units are showing signs of deterioration.

In order to improve availability, enhance operating capacity and reach a modern level of automation, extensive modernization works will now be carried out by Voith Siemens Hydro.

Works include rehabilitation of the turbine governors, reconstruction of the Pelton nozzle assembly, replacement of cooling water pumps and air compressor equipment as well as the replacement of battery systems at two power stations and the supply of a control system together with field measuring equipment.

For more information:
Raimund.Gabriel@vs-hydro.com

For the future of Afghanistan: Rehabilitation of Sarobi and Mahipar

Voith Siemens Hydro has been awarded the rehabilitation contract for the Sarobi and Mahipar hydropower plants, not far from the Afghan capital Kabul. The contract, which is worth 16.6 million EUR, was concluded with the Ministry of Water and Power in December 2003. The project will be financed by a loan from Germany's KfW (Kreditanstalt für Wiederaufbau, Credite Institute for Reconstruction).

Both projects are extremely important for safeguarding power supplies to Kabul. At present, the connections from the Sarobi and Mahipar power plants to the city grid are overloaded because of the poor condition of the plants, which were originally equipped and commissioned by Voith and Siemens in 1956 and 1966 respectively. Only 117 MW of the installed hydro capacity of 266 MW are currently available.

Moreover, two 110 kV lines and the distribution network have been partly destroyed, which means that power supplies are rationed daily and almost half of the existing connections are only supplied with electricity every other day.

Measures in detail

The rehabilitation measures are therefore key projects for the central region of Afghanistan. In the Sarobi hydropower plant, the existing units will be completely modernized and the capacity of every machine increased; in Mahipar, two of the three existing units will be partially replaced and repaired.

Signing of contract in Kabul

Sarobi area

Mahipar inspection scene

Voith Siemens Hydro will supply all electro-mechanical parts for Sarobi, including Francis turbines, generators, governors and spare parts as well as installing them and monitoring the commissioning process. The first machine is scheduled for commissioning in July 2005.

For the Mahipar power plant refurbishment is planned in two steps. The first includes delivery of new components and spare parts. In a second step – also financed mainly by KfW – the already delivered equipment will be installed and additional repair measures will be executed directly on site in close co-operation with the Afghan experts.

The future of the plants

The signing of this second phase was done on February 15, 2004. The first unit of Mahipar will be completely overhauled in June 2005. However, the contract covers much more than merely supplying the technical fittings and fixtures for the power plants: Voith Siemens Hydro experts will train the Afghan plant personnel at both sites, thus ensuring that they are optimally prepared for operating the plants after they have been commissioned.

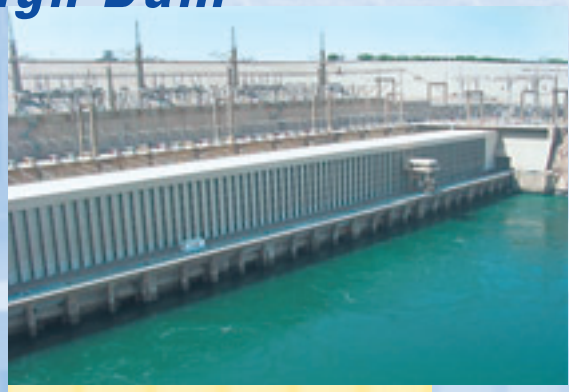
By this time, Sarobi and Mahipar will have an installed total capacity of 91 MW. The rehabilitation measures will therefore make a considerable contribution to increasing and safeguarding the energy supplies which are the basis for the sustained reconstruction of the country.

The work will be co-ordinated from the Siemens office in Kabul, which was reopened in 2003 and which is carrying on the tradition started by Siemens and Voith during their more than 70 years in Afghanistan. Voith Siemens Hydro will continue to support hydropower development in the country through its local presence.

For more information:
Claus.Schmitt@vs-hydro.com

Re-opening of Siemens Kabul office in 2003

Redevelopment in Egypt's powerful Aswan High Dam



Seven kilometers from Aswan lies the Aswan High Dam. Nearly four kilometers in length, the 111 m high Aswan High Dam links the banks of the Nile. One of the largest artificial lakes in the world lies behind the dam and impounds almost 164 billion cubic meters of water covering an area more than 500 kilometers in length.

From the very beginning, energy generation was a central aspect of the plant, which was erected between 1960 and 1971. Between 1967 and 1970, Aswan High Dam was equipped with twelve Francis turbine units with a total rated output of 2,100 MW. It is capable of generating a considerable share of Egyptian energy demand, 54% of the total generated power in Egypt in 1978, and still a remarkable 16% in 1998. That year, total annual capacity of the hydro station at Aswan High Dam exceeded 10 billion KWh.

In order to safeguard the crucial generation of clean energy for the future, rehabilitation measures are now scheduled to be carried out during the next six years. Last October, Voith Siemens Hydro in consortium with Power Machines, Russia, signed a contract with the Egyptian Ministry of Electricity and Energy in Cairo for the rehabilitation of the generators for Aswan High Dam hydropower station.

Voith Siemens Hydro is the leading partner in the consortium and is responsible for the overall project management, basic and detailed design, along with its partner Power Machines, as well as the stator rewindings for six generators, rotor windings and monitoring systems for all twelve units. Power Machines, the original supplier of the electrical components of Aswan High Dam, will be responsible for managing the Russian contribution of supplies and services as well as for the manufacturing and erection of some of the equipment.

The project is financed by Germany's KfW (Kreditanstalt für Wiederaufbau, Credit Institute for Reconstruction).

For more information:
Ioan.Triponescu@vs-hydro.com

Successful collaboration with trusted partners in Kürtün, Turkey

The well-established collaboration between Voith Siemens Hydro and its Turkish partner, TEMSAN, marked a new stage in December 2003: the Kürtün hydropower project in the north-east Anatolian province of Gümüshane was brought to a successful conclusion.

Proven distribution of tasks

The smooth project wind-up was the result of the successful distribution of tasks. The Voith Siemens Hydro engineers assumed responsibility for the electrical and mechanical components. This included the construction of two Francis turbines and the manufacture of the runners, the guide bearings and the turbine governor.

Both machines were equipped for turbine operation mode and condenser operation mode. The units are able to provide active and reactive power to the grid. As in the previous joint projects in Kralkizi, Suat Ugurlu and Beyköy, TEMSAN manufactured all the important steel components such as draft tubes, spiral cases, guide vanes and shut-off valves in the local market.

Forecast

In the future, Kürtün will generate 80 MW from two Francis turbines, each with a runner diameter of 2,600 mm, rated at a head of 83.6 m, thus contributing to a stable frequency and voltage level in the high-voltage network of electricity supply to the area.

For more information:
Franz.Bechtel@vs-hydro.com

Construction of Brazil's Capim Branco and Peixe Angical under way

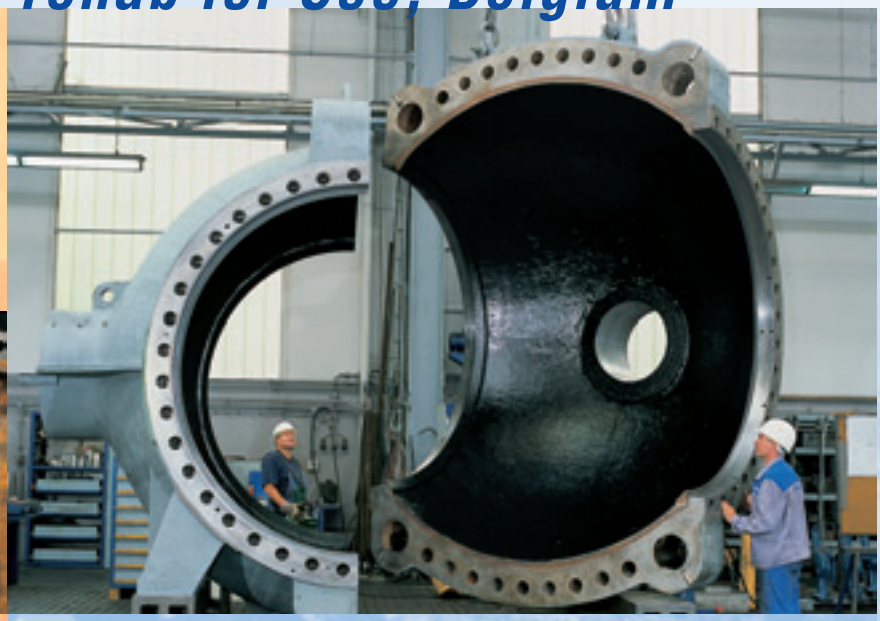
The construction of the 240 MW hydropower plant Capim Branco I started in September 2003. The plant, which comprises three 80 MW machines, is located on the Araguari River in the Brazilian state of Minas Gerais. The respective units are scheduled to commence commercial operation in January, March, and May 2006. The construction of Capim Branco II, which will also be equipped with three generating units, will start in the near future.

The construction of the 450 MW Peixe Angical hydropower station resumed last October, after some financing difficulties had halted the project for a year. Despite the disruption, the engineering team of Voith Siemens Hydro did not stop the project but took advantage of the extra time to finish the important turbine model tests.

Peixe Angical, located in the Brazilian state of Tocantins on the river of the same name, will be equipped with three 8.6 m diameter Kaplan turbines, rated at 153 MW under a head of 24.3 m. Peixe Angical's three generating units are now expected to commence commercial operation in May, July and October 2006.

For more information:
Camila.Varussa@vs-hydro.com

Spherical valve rehab for Coo, Belgium



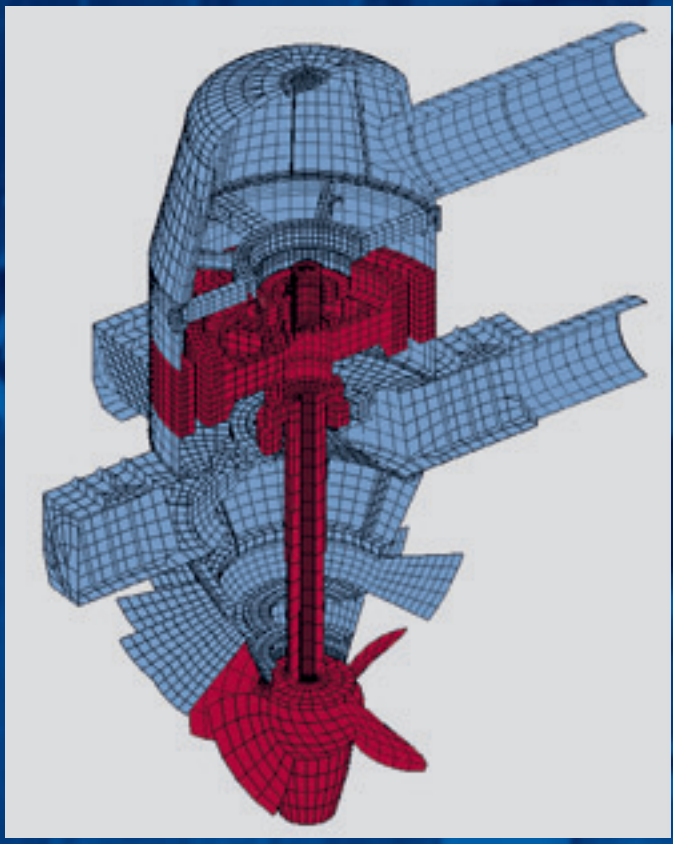
The Coo pumped storage plant, located in Belgium is operated by Electrabel and is equipped with six Voith Siemens Hydro Francis pump-turbines, three in the Coo 1 stage and three in the Coo 2 stage power houses. The overall installed capacity of Coo exceeds 1,100 MW.

After 30 years of operation, the spherical valve of unit 3 in Coo 1 had to be completely overhauled in Voith Siemens Hydro's Heidenheim workshop under a very tight schedule from Electrabel: the valve was refurbished on schedule and the very successful pressure tests were witnessed by the customer.

For more information:
Reiner.Gloeckler@vs-hydro.com

51st Ohm Technical Prize awarded to Voith Fuji Hydro in Japan

In November 2003, Voith Siemens Hydro's Japanese entity, Voith Fuji Hydro K.K. and major Japanese electric utility Tohoku Electric Power Co. Inc., were awarded the prestigious Electrical Science Technologies Enhancement Prize (Ohm Technical Prize). The Japanese Electrical Science Technologies Enhancement Association sponsors this award. Both parties were honored for their significant technical contribution to the hydro power industry through the development of innovative large capacity vertical bulb turbines and generator technologies.



As most of the Japanese locations suitable for large-capacity hydro-power stations with high economic efficiency have already been developed, Voith Fuji Hydro and Tohoku Electric Power Co. have been studying possibilities of modernizing existing power stations and installing new power stations at existing dams for economic and environmental advancement.

Kazuo Otani (left) and Hiromu Hayama (right) received the award for Voith Fuji Hydro K.K.

At low-head locations, horizontal bulb turbines and generators are usually installed and – due to their structures – require voluminous installation space. Additional problems for most of the construction works are posed by geographically complex conditions. Voith Fuji Hydro and Tohoku Electric Power Co. confronted these difficulties jointly; they developed advanced technologies for vertical-bulb turbines and generators and proved their feasibility and superiority.

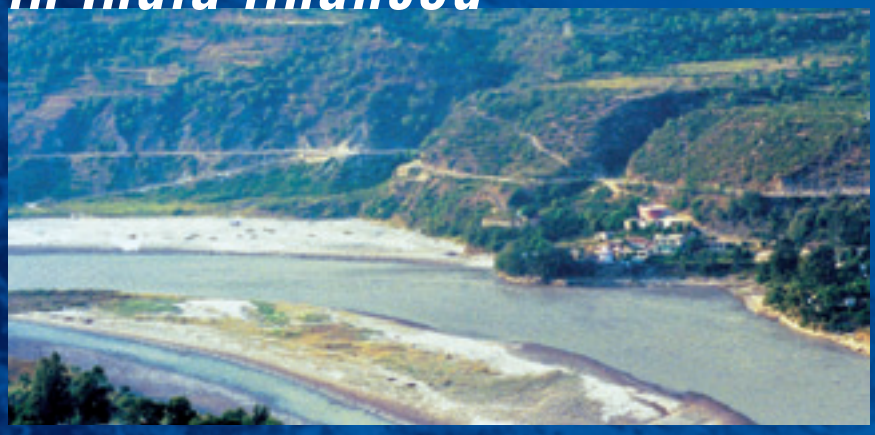
At the Kaminojiri 2 Power Station, located on the Agano River, Voith Fuji Hydro put the newly developed concept into practice for the first time. The engineers designed, manufactured, and installed a vertical bulb turbine and generator unit whose main features include the reduction of the space needed for the powerhouse, the increase in generated power, higher flexibility in selecting the powerhouse location, and low maintenance requirements through the reduction of auxiliary equipment. The innovative 14 MW output power plant was successfully commissioned in June 2002 and has been operating smoothly ever since.

For more information:
Naoto.Yoneyama@vs-hydro.com

Kaminojiri No.2

Turbine:	Vertical bulb
Output:	14 MW
Head:	15.54 m
Discharge:	100 m^3/s
Speed:	167 rpm
Generator:	Vertical synchronous
Output:	14,300 kVA
Voltage:	11 kV
Frequency:	50 Hz

330 MW Shrinagar hydropower project in India financed



Powerhouse location

Voith Siemens Hydro and its subsidiary Synergics Energy Development (USA) completed the equity financing of the 380 million US-Dollar, 330 MW Shrinagar Hydropower Project in Uttaranchal, India, partnering with the largest private Indian utility company, Tata Power Company. Past collaboration by both sides includes the installation of equipment for three 24 MW units in the Khopoli hydropower station.

Project development

Shrinagar is a run-of-river project located on the Alaknanda River, one of the two major tributaries to the Ganges River in the Himalayan foothills in the newly created state of Uttaranchal. The new hydropower plant will significantly augment electricity supply to the northern region. Synergics developed this important project from concept to start of construction. All permits, designs and environmental approvals for the project were obtained by Synergics. The equity financing deal for the project closed in December, paving the way for its completion.

Dam location

Devi Dari temple

Reservoir location

Tunnel exit and desilting basin site

Project details

Shrinagar project will have four 82.5 MW vertical Francis turbines designed for 66 meters of head and 560 m^3 of design flow, annually generating 1,600 GWh. The Shrinagar scheme is particularly advantageous due to the Shrinagar Valley topography that allows for development of a diversion scheme with a surface canal and a relatively short tunnel (900 meters) as well as a dam location that will create a reservoir with a limited submergence area and very low environmental impact.

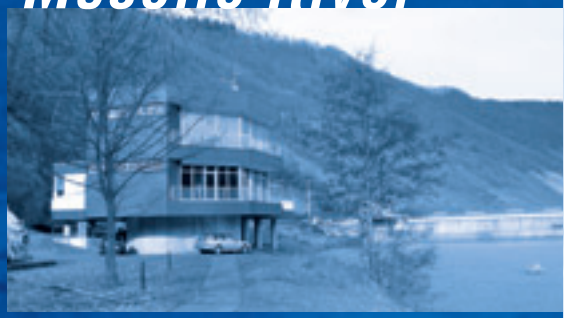
Project implementation

Currently Synergics' development specialists and Voith Siemens Hydro technical specialists are working with Tata Power Company to finalize the construction plans. The project represents one of the largest investments in renewable energy in the private power sector in Asia. In the long term, this renewable and sustainable source of energy will provide substantial economic benefits to the over three million people in the region. The Shrinagar project will improve the quality of life for India's northern areas, eliminate over 2.2 million tons of greenhouse gas emissions per year, and avoid the burning of over 400,000 tons of coal annually.

For more information:
wrogers@synergics.com

Expertise in automation

Replacement of remote monitoring and control on Germany's Moselle River



In the 1950s and 60s, the development of the Moselle River as a major shipping lane also gave rise to the opportunity of erecting ten run-of-river power stations between Koblenz and Trier. They have been generating electricity for more than 40 years.

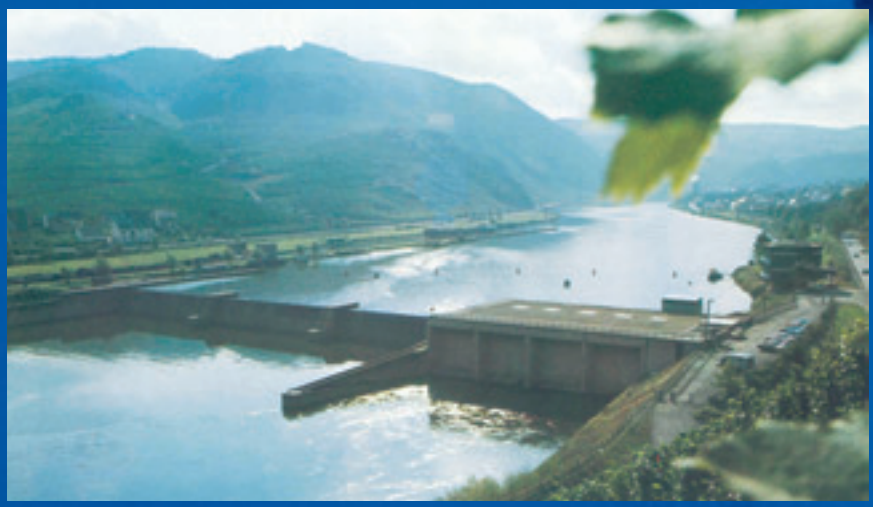
Central control room in Fankel

In all, 17 power stations on the Moselle and 7 on the Saar are monitored and controlled from the central control room in Fankel (near Cochem). In co-operation with Siemens, Voith Siemens Hydro has been progressively replacing the entire remote monitoring and control system in Fankel since August last year.

From this switching center, which is manned around the clock, the entire run-off process of the two rivers is controlled primarily for shipping, as the water level of the Moselle may only fluctuate by +/- 5 cm on each reach. The remote terminal units of all 10 German Moselle power stations are also to be replaced.

In this way, exact operating data for the operation of the power stations can be obtained by continuous automatic measurement of the water levels.

With the precise data calculated in the central control room in Fankel, each local power station can then manually regulate the run-offs.



Through this exact regulation of water levels, the power station operator, RWE Power AG, can ensure that the water is sufficiently deep for shipping. The commissioning of the completely replaced control system with all substations is scheduled for July this year.

For more information:
Werner.Nowak@vs-hydro.com

Automation of Montenegro's most important hydropower station

Hydro power plays a very prominent role in Montenegro, accounting for 76% of the country's total installed hydro capacity of 850 MW.

The almost 40-year-old Perucica hydropower plant is of particular importance to the Montenegrin energy sector. The plant is located on the Gornja Zeta River. It is a run-of-river power station with a head of 550 m. Its seven hydroelectric units have a combined capacity of 307 MW, representing almost half of Montenegro's hydroelectric generating capacity.

EPCG delegation in Heidenheim/Germany

Voith Siemens Hydro has been awarded the contract to rehabilitate the entire automation system at the Perucica hydropower station by Electric Power Industry of Montenegro Stock Company, Niksic (EPCG). The total volume of order for Voith Siemens Hydro amounts to 7.3 million EUR.

The scope of supply for Voith Siemens Hydro covers installation of new excitation systems for four 40 MVA units, installation of a completely new automation as well as a monitoring system and partial rehabilitation of auxiliary power supply. The modernized plant will be also equipped with the newly developed VSHyCon Excellent CS7 control system, which is a maintenance-friendly plant control system for hydropower plants that integrates all power plant control functions from sensors and actuators to central plant control level.

The plant will be completed in 2006. The project is completely financed by the Germany's KfW (Kreditanstalt für Wiederaufbau, Credit Institute for Reconstruction).

For more information:
Ronald.Schwarz@vs-hydro.com

Successful model acceptance for Longtan

In September 2003, the successful model acceptance for the Chinese hydropower station Longtan took place at Voith Siemens Hydro's Central Technology facilities. The model turbine for the second largest hydro power project in China after the Three Gorges project was intensively tested in the presence of the customer, Longtan Hydro Power Development Co.
The contractually required guarantees and operating regimes were fulfilled to the customer's satisfaction.

The Longtan hydropower plant is located on the Hongshui river in the Guangxi province in the south of China. This location makes Longtan a key project: in the future, the hydropower station will supply electricity to both, the previously rather underdeveloped south-west and the energy-starved eastern regions.

It will be equipped with seven vertical Francis turbines with a rated capacity of 714 MW each and a runner diameter of 7.9 m. These huge runners present a logistic challenge, as it is not possible to transport finished runners of these dimensions. The runners will be manufactured at site by the consortium members Voith Siemens Hydro Shanghai and Dongfang Hydro Electric Machinery Co. For this purpose, a special building with production workshop is foreseen near the hydropower plant.

The contract was awarded to the consortium in January 2003 and the entire hydraulic and mechanical basic engineering executed by Voith Siemens Hydro. The share of Voith Siemens Hydro will be engineered and manufactured by Voith Siemens Hydro Shanghai.

The first unit is scheduled for commissioning in 2007, the project will be completed in September 2009. Once it is complete, Longtan will be among the largest hydropower stations in the world with a total capacity of 5,000 MW.

For more information:
Peter.Faigle@vs-hydro.com

Turbines for 1,840 MW Hydro Project Shuibuya in China

Contract signing ceremony in Yichang: Wang Jingyuan (right), President of Quingjian Shuibuya Hydro Project Contruction Co. Ltd.; Dr. Konrad Roth (left), President of Voith Siemens Hydro Shanghai

Voith Siemens Hydro has been selected to supply the four 460 MW Francis turbines for the Shuibuya hydroelectric project in Hubei Province, China.

The turbine contract, which was signed on December 22, 2003 by representatives of Voith Siemens Hydro, Shanghai, and Hubei Shuibuya Project Construction Co. Ltd, is worth approximately 30 million US-Dollar.

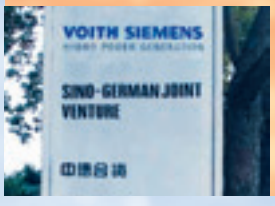
The scope of supply for Voith Siemens Hydro covers the mechanical equipment and design for four Francis turbines with an output of 460 MW each at a head of 185 m, as well as auxiliaries for turbines. The commissioning of the first unit is planned in 2007, the project will be completed in 2009.

Shuibuya hydropower station will be the third hydroelectric project ever constructed on the Qingjiang River, a major tributary to the Yangtze River. The power station will play an important role in the regulation of water levels on the Yangtze River during the summer flood season and will help to balance peaking power demand in central China's power grid, thus enhancing safe and reliable operation of local power grids.

For more information:
Michael.Liu@vs-hydro.com

Change of company name

In November 2003, former Shanghai Hydro-Power Equipment Company, Ltd. (SHEC) was renamed to Voith Siemens Hydro Power Generation Shanghai, Ltd.



The change of the company's name has no affect on the structure of the shareholders, which remains the same, with Voith Siemens Hydro as the majority shareholder. The new name documents that Voith Siemens Hydro Shanghai is a member of Voith Siemens Hydro Power Generation and has full access to the technology and experience of this worldwide leading company serving the hydropower industry. It has been well established and is successfully operating in the Chinese market with good prospects to participate in the fast growing hydro market in China.

For more information:
Michael.Liu@vs-hydro.com

Recent US contract awards

Bath County

Dominion Virginia Power is upgrading the six generating units at the Bath County Pumped Storage Station. Voith Siemens Hydro York was selected as a partner to provide equipment and installation services.

The rehabilitation project began in July, 2003 and will continue for the following six years. During the upgrade of each unit, five shipments of over-weight and over-sized components must be completed by a heavy haul transportation specialist. The first of the 90 ton runners was sent to the site and each of the two 100 ton headcover halves made the trip to and from the factory in York where the rehabilitation was performed.

Bath County – transportation of heavy components

Rocky Reach

The Rocky Reach Turbine Rehabilitation Project has been completed and accepted by the owner, Public Utility District No. 1 of Chelan County. This project is located on the Columbia River in Washington State, USA.

The project consisted of complete turbine rehabilitation and runner replacement for eleven vertical Kaplan machines, seven units of 7,112 mm diameter and four units of 8,204 mm diameter.

Conowingo Dam

The project was awarded to Riva in January 1993 (now Voith Riva Hydro). The final unit was re-commissioned in April 2003 and the work crews released in June 2003. All technical and commercial items were completed on time.

Conowingo Dam

Voith Siemens Hydro has also been selected to modernize the remaining four units at Exelon Corporation's Conowingo Hydroelectric Station in Maryland, USA. Exelon Corporation is one of the largest power producers in the United States with a portfolio exceeding 44,000 megawatts.

The uprated turbines will utilize the environmentally friendly dissolved oxygen aeration technology to improve water quality. The "aerating runner" is one of several environmentally friendly solutions which Voith Siemens Hydro offers for turbine and generator modernizations.

The Conowingo hydropower station is operated by the Susquehanna Electric Company, a subsidiary of Exelon Corporation and is located on the Susquehanna River in Northern Maryland. It has been providing electric power to the transmission system since it first began commercial operation in 1928. It is equipped with eleven units and contributes an average of 1.6 billion kilowatt-hours of electricity annually.

Rocky Reach

For more information:
Stanley.Kocon@vs-hydro.com

Striven hydropower project in Scotland

Voith Siemens Hydro has just received a rehabilitation contract for Striven hydropower station in Scotland. This project marks a special event: it will be the first time that Voith Siemens Hydro implements its Integrated Services (IS) strategy in a complete rehabilitation project outside the U.S. and demonstrates Voith Siemens Hydro's reputation as a specialist in holistic solutions. It provides tailored solutions for both new and modernization projects with the principal objective of achieving the technically and commercially optimized realization of a project, resulting in an ideal return on investment for the operator.

One-stop project implementation

In detail, IS comprises modernization services for improved performance, starting with plant condition assessment and remaining life analysis. Based on these concepts, both technical and commercial solutions will be developed closely with the customer. The specification worked out by both partners in a mutual and co-operative spirit ensures a streamlined and efficient project implementation.

Successful partnership

A framework agreement with the customer, Scottish & Southern Energy Generation Ltd. (SSE), was signed in the beginning of July 2003. Shortly afterwards, the first contract for the replacement of the guide vanes was awarded. Owing to the good results during the handling of this partial contract and the convincing efficiency of Voith Siemens Hydro site experts, the follow-up order for the complete replacement was then signed for the turbines, generators and shut-off valves, as well as for the remaining work to perform the complete refurbishment of this hydropower plant.

Highly efficient prospects

Striven hydropower station at Loch Sloy is equipped with two Francis turbines and will have a total installed output of 8 MW after rehabilitation. By the end of this year, the first unit of the highly efficient plant will generate electric power for base and peak load requirements within the British grid.

For more information:
Claus.Schmitt@vs-hydro.com

Hydro 2003 in Dubrovnik, Croatia, awarded Blue Planet Prize

The Annual General Assembly of the International Hydropower Association (IHA) met during the Hydro 2003 conference last November. During the meeting, IHA awarded the Blue Planet Prize 2003 to two hydropower plants, one of them the South African Palmiet pumped storage scheme, which is equipped with Voith Siemens Hydro pump-turbines and Voith Fuji Hydro motor-generators.

The 400 MW plant, located near Cape Town, was honored for excellence in the development and operation of a hydropower scheme, assessed on the basis of technical, economic and environmental criteria.

Palmiet was commissioned in 1988 by South African utility Eskom and South Africa's Department of Water Affairs and Forestry to provide system stability for the country's electric grid, and also to provide an extra water supply to the Cape Town region.

Right from the start of construction, extraordinary measures were applied to minimize the impact of construction on the environment and to protect the unique Cape flora.

Since commissioning, great care for the local environment has continued to be a high priority, for example by monitoring the program to prevent the ingress of non-native fauna and flora.

Meanwhile, the area has subsequently been designated a UNESCO biosphere, which testifies the positive role hydro power can play even within the most environmentally sensitive zones.

Every two years the International Hydropower Association elects candidate hydropower schemes for the Blue Planet Prize. Up to three schemes may receive the prize in each award cycle. With the support of UNESCO's International Hydrological Program, the Prize was first awarded in 2001. The aim of the Prize is to increase awareness of hydropower's contribution to sustainable development and to promote good practice in the use of the world's hydropower resources.

For more information:
www.hydropower.org

Hydro 2003 in Dubrovnic: happy faces at the well-attended Voith Siemens customer evening after the award of the Blue Planet prize.

From the left: Joachim Klein, Voith Siemens Hydro, Heidenheim, N. H. Bhula and Terry Moss from Eskom Peaking in South Africa, Richard Taylor from the International Hydro Association.

Events

IPG European Modernization Conference
Prague, Czech Republic
April 20-21, 2004
Presentation of paper on Kisköre/Hungary modernization by Voith Siemens Hydro, St. Pölten, Austria

National Hydro Association (NHA) Annual Conference
Washington D.C., USA
April 25-28, 2004
Voith Siemens Hydro, York, PA, USA

Renewables 2004
Bonn, Germany
June 1-4, 2004
Voith Siemens Hydro participation under VDMA umbrella

22nd IAHR Symposium in Hydraulic Machinery and Systems
Stockholm, Sweden
June 29-July 2, 2004
Paper presentations on variable-speed and vibration diagnosis technology by Voith Siemens Hydro, Heidenheim, Germany

Hydro Vision 2004
Montreal, Canada
August 16-20, 2004
Booth and paper presentations by Voith Siemens Hydro, York, PA, USA
Booth no. 1900

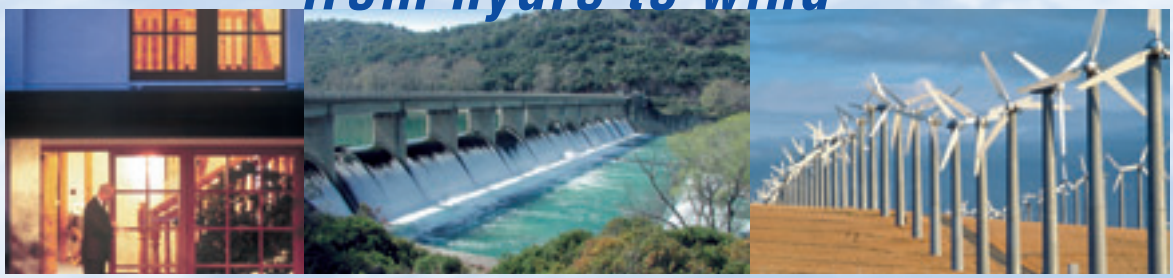
American Fisheries Society Meeting
Madison, WI, USA
August 23-26, 2004
Paper presentation on fish-friendly turbine design by Richard K. Fisher Jr., Voith Siemens Hydro, York, PA, USA

Environmental Trade Fair
Manila, Philippines
October 7-10, 2004
Participation Voith Siemens Hydro in German Pavillon

Hydro 2004
Porto, Portugal
October 16-18, 2004
Booth and paper presentations by Voith Siemens Hydro, Heidenheim, Germany
Booth no. 39-42

13th International Seminar on Hydro Power Plants
Vienna, Austria
November 24-26
Paper presentation on Braz hydropower station rehabilitation by Voith Siemens Hydro, St. Pölten, Austria

The energy balance from hydro to wind



For 150 GWh – the average annual requirement of 40,000 households – the following is required:

Wind power
50 wind wheels each rated at 2 MW:
100 MW generate an annual
150 GWh in 1,500 full-load hours.

Hydro power
One turbine rated at 25 MW
generates the same amount:
150 GWh annually in 6,000 full-load hours.

Essay

Venice of the North

This distinction is claimed by St. Petersburg, the most northerly, and to many people the most beautiful city in Russia. Like "La Serenissima" itself, the lives of its citizens are heavily influenced by the water that surrounds them.

Early in the eighteenth century, Peter the Great had the city laid out as single, monumental work of art, with the intention of making it the new capital of the Czar's empire.

Until the 18th century Russia had no sea way to Europe. At that time, trade by sea was very important for the economic development of the country. After having won the exit to the Baltic Sea, Peter I gave an order in 1703 to build a fortress on the bank of the Neva River with the aim to have military fortification on the river and a commercial gate to Europe.
His famous words were: "We will cut through a window to Europe".
After the "Petersburg Fortress" – that is how Peter I named it – and later the trade fleet had been built, he transferred the capital of Russia from Moscow to Petersburg.

Located between the estuary of the Neva River and Lake Ladoga, the city extends over an area of 606 square kilometres, of which 58 square kilometres are covered by water.

Built on 44 islands around the Fortress of Peter and Paul, St. Petersburg has 540 bridges. The Admiralty was chosen as the centre of the road network. At this shipyard the Czar laid down a mighty fleet of vessels which he used to open a "window to the West" from his new city and start a brisk and profitable trade with the European monarchies.

Near the Admiralty, the Royal Palace was built later, as was the Winter Palace, which today houses the Hermitage, one of the most comprehensive art collections in the world.

It is visited by over three and a half million people every year. Heading east from the Hermitage, you come to Nevski Prospect, a wide, magnificent boulevard which is the city's main promenade.

St. Petersburg has seen many changes in the course of its history. Wars, upheavals and two revolutions have influenced its development.
In 1905, the citizens of St. Petersburg defied the Czar until he signed the October manifesto, opening the way to Russia's first parliament.

In February 1917, the Czar was forced to abdicate, and the Soviets took control of the city under Lenin's leadership. From that time on the city was called Petrograd, but as a tribute to the state's founder following his death, was later renamed Leningrad.

In 1991, the citizens voted in a referendum to revert to the original name of St. Petersburg.

In spite of its restless history, St. Petersburg has maintained its classical appearance. The panorama of buildings along the banks of the Neva is breathtaking, and the countless small watercourses create a romantic atmosphere that is certainly comparable to that of Venice.

Fyodor Michailovich Dostoyevski (1821-1881) was one of many to be inspired by the city. The world-famous author was the creator of the philosophical Russian tragedy, and gave the city an immortal literary monument with his greatest novel, Crime and Punishment.

Today, St. Petersburg – some 651 kilometres from Moscow – is the most important center of Russian science, culture and commercial activities. The birthplace of Russian president Vladimir Putin, it was restored at considerable expense in 2003 to celebrate its 300th anniversary, and its former brilliance now shines forth again. These efforts attracted considerable international recognition and have been a strong influence for current and future investments, both domestic and foreign.

St. Petersburg was heavily industrialised even before the First World War. Today, the focus is on ship and machine building, and also diverse foodstuff and light industries. The city has the most important Russian port on the Baltic Sea and an important inland harbour at the end of the waterway that connects the Black Sea and the Volga with the Baltic.