bpc GROUP
POWER SYSTEMS

BPC POWER SYSTEMS

SUCCESSFUL SOLUTIONS OF ON-SITE POWER SUPPLY FOR INDUSTRY SECTORS

POWER WITH NO TROUBLES!

Client testimonials

"We extend appreciation to your specialists for their work on the installation of the power plant for the main office, warehouse and operational buildings at Apteki 36.6. In a short time and under difficult conditions BPC Power Systems engineers dispatched all the work including the installation and the placing of 12 Capstone 65 miniturbines. The proposed solutions are the quality of services, an innovative approach and professionalism, and advertence to our requests. These characterize BPC Power Systems as professionals in this sphere."

A.P. Efremov
Chief Power Engineer
Apteki 36.6, Moscow

"We needed a reliable source of power for the new shopping mall in Uhta, the capital of the Komi Republic. The existing connection to utility grid has been financially unviable. Therefrore we have decided in the favor of BPC Power Systems offer — an on-site power source. BPC specialists helped us choose the appropriate equipment: 3 Capstone C65 microturbines with heat recovery modules and two gas booster compressors with a total power output of 195 kW. All the installed equipment functions reliably."

A.S. Yasulya
Chief Engineer
Apis-Plus, Uhta

"The reconstruction of the boiler-house in Mikhaylovskoe Shosse in Belgorod region was finished in 2005.

The modernization of the boiler house was necessary because of the physical and moral deterioration of the equipment and the need for new consumers to the existing heat distribution network. Moreover, for auxiliary needs we installed Capstone C30 microturbine with a power output of 30 kW and a heat output of 60 kW.

Since the boiler house is located in a residential area, the following technical requirements have been imposed: low levels of noise and emission, high power efficiency, high combustion efficiency, ability to burn wide range of fuels, high degree of automation and high reliability.

The power plant equipment fully complies with these requirements. This equipment was supplied by BPC Power Systems.

The use of the BPC Power Systems equipment has allowed us to enhance the reliability of the heat supply, covering at the same time the boiler's own electricity consumption (30% during winter and 70% during summer). We greatly appreciate the quality of the services and thank company BPC Power Systems for cooperation."

M.E. Chefranov
Acting Executive Director
Teploenergeticheskaya Company, Belgorod

BPC Group headquarters

ABOUT BPC POWER SYSTEMS

BPC Power Systems is an integrated engineering company. We specialize in the construction, operation and maintenance of distributed power systems.

As an EPC-company we offer engineering, turnkey construction and maintenance of power generating sets with an output power ranging from 30–100 kW to 10–20 MW and 50–100 MW.

As an IPP-company we cooperate with our regional partners and investors to build geographically-distributed network of independent power centers united in GDGC — Geographically Distributed Generation Company.

Our solutions are based on the state-of-the-art conceptions and technologies. Particularly, in compliance with the conception of *distributed generation* heat and power producers, which are situated as close as possible to the consumer and generate energy precisely according to demand. This method minimizes transportation losses and allows us to reach a combustion efficiency of up to 90% and higher by combined power and heat (and cooling) production (*cogeneration and trigeneration*). The unique features of *microturbine generators* allow us to install generating sets without any harm to the environment both in densely populated areas and resort zones, and in remote areas such as settlements in far north or oil fields and transmission lines.

At the moment, the Company has completed more than 250 projects on independent power supply with a total output power of 160 MW. Among our clients are major Russian corporations such as GAZPROM, ROSNEFT, LUKOIL, TNK-BP, NOVATEK, ITERA, ROSTELECOM and dozens of smaller consumers: public offices, malls and entertainment centers, stadiums and water parks, schools, hospitals, and various industrial facilities.

Innovative technologies, keeping to financial terms of projects and their punctual completion have earned us a reputation of reliable partner and allowed our Company to take leading position on distributed power market.

Practical success of our Company contributed a lot to the promotion of conception of distributed power generation in Russia and helped to overcome traditional disbelief in viability of distributed power generation as independent branch of industry.

BPC Power Systems headquarters and engineering office are located in Moscow. In the Tutaev, Yaroslavl region, we are building factory manufacturing microturbines and complex power systems under license agreement with Capstone and OPRA. The Company has sales offices and technical support centers in Astrakhan, Nizhniy Novgorod, Novosibirsk, Tomsk, Tyumen, and Yakutsk.

Anatoly Loginov
President of BPC Group

More than 5 years have passed since the BPC Group established the Power Systems division. At that point of time everything — terminology, conception, and equipment — seemed to be far away from the real needs of economy, and, from the outside perspective, didn't promise to grow into a profitable business. However, time has proved once again that innovations can become the part of everyday life if you adhere to certain conditions. These conditions are — a pragmatic approach to making decisions, bottom-line orientation, rigorous attention to details at each stage of project realization, tough financial control and planning, ability to see evolving situation and to follow the chosen strategy without giving way to hesitations. These conditions can be united under one succinct word — "professionalism". Professionalism of BPC team made abstract and absolutely new to Russia conception of distributed generation to become a serious business.

Today, this business is measured by hundreds of clients, hundreds of installed megawatts, hundreds of millions dollars of commercial turnover. Our reputation, built up over the last 3–5 years, helps us win confidence of our new clients today. Our future reputation depends on how we justify this confidence during realization of our new projects. Now, while enjoying success, we must not forget that the next scale mark of our achievements is thousands.

Sincerely yours,
Anatoly Loginov

Skorokhodov Alexander
General Director of BPC Power Systems

BPC Power Systems has got what it needs to successfully realize distributed generation and independent power supply projects of any scale and difficulty. Today, we have qualified personnel of vast experience, exclusive contracts with equipment manufacturers, and stable relations with our financial partners. We are mature enough to undertake a full range of work during the whole life-cycle of a project and to have legal and financial responsibility for the eventual result. The range of our services includes studying the economic feasibility of an independent power supply project, elaboration of technical and economic assessment, engineering, implementation of coordination of the project with regulative authorities, obtaining permits, engineering works supervision, power generating equipment delivery, construction and installation works, and maintenance or complete operation of power generating unit. BPC Power Systems can offer project financing with the help of our own leasing company or our Russian and foreign financial partners. We carry out personnel training and also provide maintenance services. BPC Power Systems has vast experience in the construction of power plants for leading Russian companies. Over the years, we have accumulated rich experience in shipment and commercial operation of innovative CHP (combined heat and power) units available in wide range of power output. Our Company has its own logistics system and warehouse in Moscow, also we have technical support center. We welcome new partners of BPC Power Systems!

Faithfully yours,
Alexander Skorokhodov

SUCCESSFUL SOLUTIONS OF ON-SITE POWER SUPPLY FOR INDUSTRY SECTORS

ON-SITE POWER GENERATION SYSTEMS IN RUSSIA

Due to the current conditions the concept of distributed power generation becomes more popular and is perceived as not just an addition, but a real alternative to conventional utility grid. The attractiveness of distributed power systems, which are built in close proximity to the consumer and to the maximum extent take into account the individual characteristics of the consumer's power and application, consists in controllability, reliability, economic efficiency (including through absence of transportation losses), scalability, and operational flexibility. Today in Russia distributed generation systems, in most cases are presented in the form of autonomous energy centers. Since the connection of generators to the centralized network is limited by the imperfection of the regulatory system, the independent power supply industry in Russia has the potential for growth at significantly higher levels than the world average. This is due to a combination of factors such as the rapid development of the country's economy against the backdrop of a prolonged lack of investment in the modernization of a centralized power generation industry, significant depreciation of network infrastructure, the remoteness of many consumers from electricity network, the availability and relatively low cost of fuel for the autonomous generation systems.

High charge for connection to a centralized electricity network eventually equalizes the initial connection costs and the costs on construction of on-site power source. In this case energy costs are usually two times lower than the established tariffs for electricity and heat. Thus, the payback period of investments in distributed generation power system is only 2–3 years and it continues to decrease.

Company BPC Power Systems has already realized more than 250 projects in the field of distributed power centers construction in Russia and CIS countries. The total capacity of all on-site generation facilities, built by BPC Power Systems is made up of ***160 MW*** *of electricity and* ***300 MW*** *of thermal energy.*

BPC POWER SYSTEMS: VALUE OF OUR SOLUTIONS

ECONOMIC BENEFITS:

- High economic effectiveness — investments payback period averages 2–4 years, project profitability is more than 30%, and cost of 1 kW of electricity is two times lower than utility grid tariffs
- High energy efficiency — combustion efficiency is more than 90%
- Energy conservation through cogeneration (combined heat and power production) and trigeneration (power, heat, and cooling)
- Absence of energy transportation losses
- Low operational costs

TECHNICAL BENEFITS:

- Scalability — wide single-unit power range: from 30 kW to 100 MW
- Efficiency in cogeneration and trigeneration cycles — higher than 90%
- Short terms of engineering and installation — 6–18 months
- High degree of automation, system of remote control and monitoring
- Easy and fast routine maintenance
- High reliability through internal redundancy
- Operational flexibility from 0% to 100%, ability of continuous operation at low loads
- Compact sizes and light weight, rooftop installation option
- Modular design gives opportunity to gradually increase power output of the system
- Ability to consume non-standard fuels, including low-BTU gas, pyrogas, sour gas, etc.
- Absence of expensive exhaust gas ducting

ENVIRONMENTAL BENEFITS:

- Ultra-low emissions of NO_x and CO_2 (<9ppm)
- Low level of noise (65–70 dB), low level of vibrations
- Absence of motor oil, coolants, and lubricants

FUEL

- Natural gas
- Wellhead gas
- Gases with unstable contents
- Biogas
- Liquid fuels (kerosene, diesel)
- Propane/butane mix
- Low-BTU gases
- Condensed gas
- Pyrogases
- Coalmine methane

FINANCIAL VIABILITY OF DISTRIBUTED POWER GENERATION SYSTEMS

The core of the energetic solutions of the BPC Power Systems is the state-of-the-art effective power generation equipment — usually, microturbines or low-power turbines, which consume 0.21–0.37 m^3/h of gas fuel for production of 1 kW of electricity and 2 kW of heat (or 1.6 kW of cooling) as a by-product. Hence, one cubic meter of gas (its cost in 2008 was 3 rubles) is enough to produce 3 kW of electricity and 6 kW of heat, in other terms the net cost of 1 kW of electricity equals 1 ruble, additionally owner gets 2 kW of heat energy. The operating costs of such energy system (personnel, spare parts and consumables) total about 20 kopecks for every 1 kW of electricity. Thus, the distributed generation system saves between 1 to 2 rubles per kilowatt of electricity (and this is without the production of the additional heat or cooling).

Turnkey construction of on-site power system costs about 50 rubles per 1 kW of installed capacity, investments payback time ranges from 2 to 4–5 years, depending on current rates, degree of loading during day and waste heat utilization in the seasonal cycle. Taking into consideration the fact that in most regions of the country fees for connection to centralized electric network have been introduced, the actual investments payback time of distributed power system is even lower. As the fee for connection averages 15–20 thousand rubles per 1 kW of electricity, the real payback periods of own generation projects do not exceed 3 years. In some cases, the installation of distributed power generation system is initially cheaper than the connection to the utility grid — even without taking into account the savings due to lower cost of electricity compared to the network tariffs. For example, in the center of Moscow the cost of connecting to the urban utility grid in 2008 was 102 thousand rubles per 1 kW — that is twice as expensive as building an on-site power system. In order to optimize investments in projects on distributed power systems, company BPC Leasing offers long-term leasing schemes. As a rule, it is possible to develop such a payroll scheme wherein the amount of lease payments is less than or equal to average payments for electricity and heat according to energy tariffs. Among the facilities which are considered to be well-suited for the installation of distributed generation system are small consumers of electricity, heat and cooling with a relatively high and uniform level of consumption, and any new facilities without access to utility grids.

The most promising application fields of the distributed generation systems are as follows:

- Housing and public utilities, social infrastructure, new buildings;
- Office buildings, hotels, shopping malls, logistics centers;
- Sports and fitness centers, swimming pools, water parks, resorts;
- Oil and gas facilities, wellhead gas utilization.

Company BPC Power Systems also offers special solutions for the installation of distributed power systems:

- Standby power systems;
- Radio relay stations;
- Pipelines control systems;
- Individual systems of distributed generation, designed and built in accordance to the needs of a customer.

SOLUTIONS FOR INDUSTRY SECTORS

Distributed generation system advantages

SOLUTIONS FOR ON-SITE POWER SUPPLY:
HOUSING AND PUBLIC UTILITIES, INFRASTRUCTURE

PROBLEMS OF THE SECTOR

The most serious problems the housing and public utilities face today are deterioration of infrastructure, decentralization of power and heat sources, low efficiency of generation equipment, and heavy losses during the transmission of energy. As a result, energy tariffs for the population rise as the investment appeal of the industry decreases. Often, the development of housing and public utilities is significantly lagging behind the overall growth of housing and social spheres, creating a real shortage of electricity and heat.

SOLUTION

Microturbines operating in cogeneration cycle help dramatically increase the efficiency of boiler-houses during their reconstruction or in the process of their building. Microturbines act as the main source of electricity for the boiler's auxiliaries (the utility grid can serve as reserve and second source of power to ensure the highest level of reliability). Heat energy generated as by-product is used in main heating circuit during winters and allows turning off main boilers during summers, providing hot water for all needs. The increase of microturbines' power output over boiler's own needs turns the boiler house into a mini-CHP, which is able to fully cover the needs of a housing complex or village in heat and electricity.*

CHP-system for city boiler-house

On-site power plant:
2 Capstone C60 microturbines with integrated heat recovery modules (HRM)

Typical energy consumers

Power supply for boiler-house auxiliaries

Distributed power generation systems for residential blocks and villages

Private houses and cottages

Similar projects

Moscow-City Business Center, Moscow

Boiler house, Belgorod

COGENERATION SYSTEM (CHP)

The commercial operation of a generator set consisting of two turbines (Capstone C60) started in 2004. This set was designed for independent power supply of Mytishchi district boiler and works in parallel with the utility grid.

Capstone C60 microturbines with integrated heat recovery modules were chosen as the main power source for the boiler house. Supply, installation and launch of the system were carried out by BPC Power Systems. Microturbines operate in cogeneration mode, which provides a significant fuel saving by utilization exhaust gases for production of thermal energy.

Due to the fact that the boiler house is located in a residential area, the independent power generation equipment faces strict requirements for levels of noise and harmful emissions. Capstone microturbines satisfy the strictest environmental requirements: acoustic emissions — 70 dBA at 10 meters; NO_x emissions — < 9 ppmV.

This project was the first experience of installation of grid-connected Capstone microturbines in Russia. Relatively low level of electricity consumption by boiler-house auxiliary equipment, excessive power of turbines is transmitted to the city utility grid, thus supplying other facilities with power. In case of failures in the utility grid the Capstone microturbines begin stand alone operation automatically.

* CHP — combined heat and power.

Company BPC Power Systems builds highly-efficient cogeneration and trigeneration energy systems with a high ratio of fuel consumption for the power supply, heating and air conditioning. In the area of housing and communal services microturbine power systems are used for power supply boiler house auxiliaries, during reconstruction of boilers at mini-CHP plants, as well as a main source of heat and electricity during the building of residential blocks and villages.

RECONSTRUCTION OF BOILER HOUSE

By order of the company Belgorodenergo specialists of BPC Power Systems installed Capstone C30 microturbine in boiler house Mikhailovskoye shosse. During testing M.E. Chefranov, executive director of OAO "Teploenergeticheskaya Kompaniya", said: "Microturbine Capstone C30 consume natural gas. Combined production of heat and power ensures high combustion efficiency (more than 85%). Capstone microturbine has shown stable operation both at low loads of 10–15 kW, and at full nominal power output of 29–30 kW". M.E. Chefranov added that this microturbine solves the problem of the autonomous power supply of the boiler house during grid outages.

According to experts payback period of the microturbine will not exceed 3.5 years. Prime cost reduction depends on utilization of thermal energy from exhaust gas.

Capstone microturbines have the following advantages: ease of use and maintenance, environmental friendliness and high efficiency, compactness, reliable operation, absence of motor oil and lubricants.

"Specialists of OAO "Belgorodenergo" engineering policy department learned about Capstone microturbines at an exhibition on energy saving technologies in March, 2004", — explained V.M. Morgun, the head of OAO "TEK" investment department. As a result of negotiations between the Department of Technology Policy specialists and representatives of BPC Power Systems a contract for the supply, installation supervision and commissioning of the generating system was concluded.

The launch of Capstone microturbine attracted the interest not only of top managers of Belgorod power companies, but also of representatives of Lipetsk city power company, as well as general directors and heads of Verhknevolzhskiy and Yuzhniy regional branches of MRSK-1. Everybody noted that Capstone microturbines possess several characteristics that make them possible to use in many different fields of application — in small boiler houses, objects of housing and utilities, small and medium-sized industrial enterprises, as well as a backup power source for livelihood.

Boiler house reconstruction

On-site CHP-plant based on Capstone C30 microturbine

Fuel – natural gas

Typical energy consumers

Power supply for boiler-house auxiliaries

Distributed power generation systems for residential blocks and villages

Private houses and cottages

Similar projects

Moscow-City Business Center, Moscow

SOLUTIONS FOR ON-SITE POWER SUPPLY:
OFFICE BUILDINGS, SHOPPING MALLS, SUPERMARKETS

PROBLEMS OF THE SECTOR

Every year a large number of offices, public and commercial buildings are built in Russia. These buildings meet modern requirements for infrastructure and comfort and belong to the category of energy-intensive structures. The main energy consumers are conditioning and engineering systems. Increasingly, there is a situation where the connection to the utility grid substantially exceeds the budget expectations of investors, the timing of connection is unpredictable or severely lagged behind the timing of construction. Another problem is the fast growth of energy costs in the total cost of building maintenance, which increases the payback period and reduces investment attractiveness (or market value) of development projects.

SOLUTION

Distributed power generation systems from BPC Power Systems are not only a cheaper alternative to connection to utility grid, but also help save up to 60% of the cost of energy during the operation of facilities. Investments payback period of the distributed generation system in large shopping malls or office centers does not exceed 2–3 years throughout the territory of Russia. Extra savings can be reached by using trigeneration. In this case, the thermal energy of microturbine exhaust gas is utilized by absorption chiller for production of cooling for space conditioning instead of using common electric conditioners.

BENEFITS

Short construction period. Significant savings on energy, heating and air conditioning costs during the operational phase.

Office and warehouse center

On-site power plant:
12 Capstone C65 microturbines with integrated heat recovery unit — 1.13 MW

Absorption chiller — 750 kW

Typical energy consumers

Office centers

Hotels

Similar projects

Shopping mall in Uhta, Komi Republic

OFFICE AND WAREHOUSE CENTER

In January 2007, a project on distributed generation system installation in a new office and warehouse center of company ZAO “Apteki 36.6” was successfully completed.

As a result of comparative analysis of power supply solutions carried out by experts of ZAO “Apteki 36.6” it was decided to install an on-site power generation system because of its economic feasibility. The arguments in favor of an on-site generation system were: independence from the urban utility grid, reduction of energy costs and reliable power supply.

Selection of Capstone microturbine was made due to extremely low operating costs, high environmental characteristics and the opportunity to use the power system in trigeneration mode, which significantly increases the overall combustion efficiency and completely solves the problem of facility heating and air conditioning.

The project was completed within 8 months. It was the first implementation of new-generation microturbines Capstone C65 in Russia. The main feature of the project is an extremely fast return on investment.

Power generation system is based on 12 Capstone C65 microturbines and located in specially equipped building. Microturbines consume low-pressure natural gas.

Generation system operates in trigeneration mode, which allows the use of the thermal energy from exhaust gas for the heating and cooling of premises. The installation at ZAO “Apteki 36.6” is one of the most typical examples of Capstone microturbines in use.

The building site of the Moscow International Business Center (MIBC) Moscow-City is located on the Krasnopresnenskaya embankment and occupies an area of about 100 hectares, 60 of which are subject to the new buildings. It is a unique and complex project. MIBC Moscow-City is the first zone of business activity, which will bring together business, living and leisure in Russia and Eastern Europe.

INTERNATIONAL BUSINESS CENTER MOSCOW-CITY

In 2006, BPC Power Systems accomplished delivery of OPRA gas turbine power plant, which has become part of power supply system that provides the electricity needs for the construction of a new business center — Moscow-City. After commissioning the first stage of the mini-CHP plant that ensures reliable power supply for constructional needs, it was decided to supply one more OPRA unit with an electric power output of 1.8 MW.

Features of OPRA gas turbines:

- Reliable power supply;
- Short terms of installation;
- Low operational costs;
- Long overhaul life;
- Low emissions and noise levels;

This project is a good example of the use of small turbines for power supply of large-scale facilities. A high level of energy consumption is typical for the equipment in operation.

Higher levels of energy consumption typical for operation of the building equipment and the necessity to provide construction sites with high-quality power make the on-site CHP plants based on OPRA gas turbines the most cost-effective and economically viable alternative power source for such applications. At the same time the owner has an opportunity to gradually increase the capacity of the power generation system in according when needed. Successful operational experience of on-site power generation plant at MIBS Moscow-City creates great interest to the solutions of BPC in the field of power supply at construction sites.

Business Center

On-site power plant:
2 OPRA gas turbines —
1.8 MW each

Typical energy consumers

Office centers

Hotels

Shopping malls

Similar projects

Commercial and public buildings

Avenue shopping mall, Magnitogorsk

SOLUTIONS FOR ON-SITE POWER SUPPLY:
SPORTS AND FITNESS COMPLEX

PROBLEMS OF THE SECTOR

Modern sports facilities — swimming pools, ice palaces, stadiums, ski resorts and recreation complexes — are socially important, but they demand large energy resources and require significant investments during maintenance and operation. Sports and recreational facilities should meet stringent environmental requirements, such as low emissions, low levels of noise and vibration.

SOLUTION

On-site microturbine power plants allow savings of up to 60% on the energy costs of sports facilities. Extra savings can be reached by using cogeneration and trigeneration. In this case, thermal energy of microturbine exhaust gas is utilized for heating premises and water, maintaining a given temperature of the water in swimming pool, and air conditioning. Microturbine power plants meet the most stringent environmental standards and regulations and can be installed directly on-site.

BENEFITS

Low maintenance and operational costs. Utilization of free thermal energy for heating and air conditioning facilities. On-site power generation systems based on microturbines are the best solution for the sports facilities power supply, almost regardless of the availability of the utility grid and cost of connection to it.

Green power plant for ski resort

On-site power plant:
30 Capstone C60 microturbines

Similar projects

Sports and recreation center Zhemchuzhina Sibiry in Tyumen

Ski resort Krasnaya Polyana, Sochi

IGORA SKI RESORT

In 2006, on-site power system was installed at sports center Igora located in the Leningrad region. The power plant consists of 30 Capstone C60 microturbines.

Ski centers with a developed infrastructure require much power of high reliability. This was a major argument in favor of creating on-site power plant. Capstone microturbines were selected as the basic generating equipment due to high level of reliability, ease of operation and maintenance, and low operational costs.

The environmental features of Capstone turbines were also a great benefit — a minimum level of emissions and low noise level are vital characteristics of equipment used for sports facilities power supply. 1.8 MW on-site power system powers ski lifts, hotels and office buildings, as well as illumination of the mountain slopes in the evening time. The power plant operates in cogeneration mode: thermal energy of exhaust gases are used for the heating of residential and commercial premises.

The on-site power plant operates in cogeneration mode: microturbine exhaust is used for the production of heat for premises and offices and the ski-resort's hot water supply. This project was the first example in Russia and CIS of the operation of 30 Capstone microturbines as one power block. Capstone microturbines design allows interconnecting of up to 100 units.

Company BPC Power Systems has been chosen by OAO "Gazprom" as a subcontractor on the project for construction of power plant for ski resort, which is the part of the development program of Sochi for the Winter Olympics 2014. OPRA gas turbines and Capstone microturbines are to be used as the power supply equipment. Supply, installation supervision and the commissioning of the generating system has been performed by BPC Power Systems

SKI RESORT KRASNAYA POLYANA

Krasnaya Polyana is a resort town with its own long history attracting thousands of tourists today. It used to be a mountain village, situated in a picturesque river valley 45 kilometers away from the coast of the Black Sea, and now it claims to be the most modern and popular of ski resorts in Russia. Lots of new hotels, lifts, ski slopes, tourism and recreation facilities are being built here in preparation for the Winter Olympics of 2014. Such large-scale construction requires more electrical power and a reliable uninterruptible power supply. This was the main reason why OAO "Gazprom" decided to install an on-site gas power plan at ski resort in Krasnaya Polyana. OPRA gas turbines with an electric capacity of 1.8 MW (each) were chosen as the main power generating equipment. The selection was made in favor of OPRA turbines primarily for their low emissions (NO_x less than 20 ppm) and low noise level. OPRA turbines-based power plant was designed with regard to the seismic conditions of the area.

The initial (cold) start of the power plant is performed by four Capstone C60 gas microturbines. Generated energy is used for powering ski lifts and hotel buildings, including residential buildings, villas and government houses for official delegations. Power plant operates in cogeneration mode. Thermal energy of exhaust gases is utilized for production of hot water for heating the premises of the ski resort.

Green power plant for ski resort

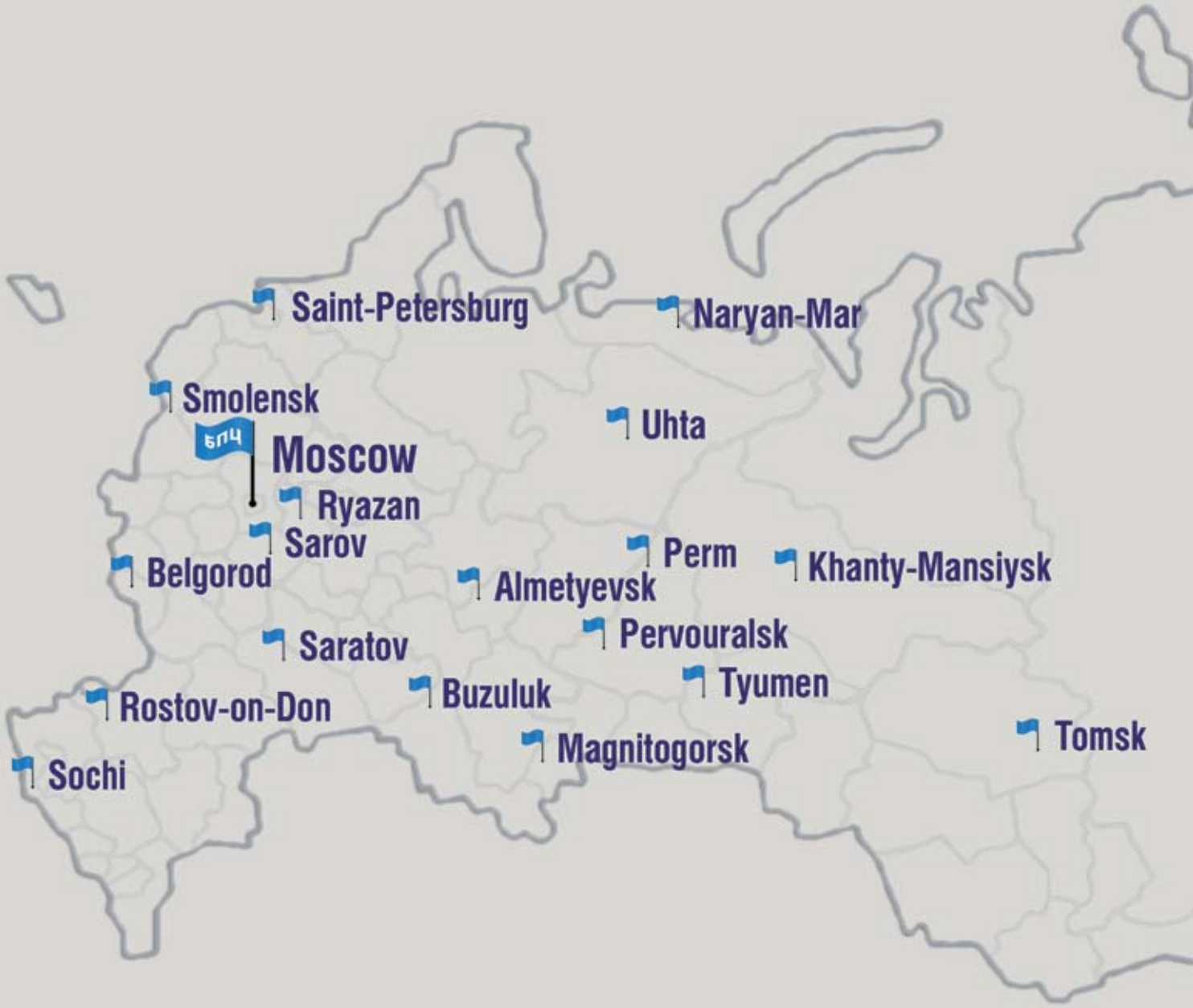
On-site power plant:
6 OPRA gas turbines – 1.8 MW each
4 Capstone C60 microturbines

Similar projects

Sports and recreation center Zhemchuzhina Sibiry in Tyumen

Sports and recreation center and swimming pool Vake, Caucasus region

Geography of microtubine installations



Almetyevsk	1 x CAPSTONE C30, TATEX
Belgorod	1 x CAPSTONE C30, BELGORODENERGO
Buzuluk	6 x OPRA GENSETS, TNK-BP
Magnitogorsk	1 x CAPSTONE C60, AVENUE
Moscow	12 x CAPSTONE C65, APTEKI 36.6
	8 x CAPSTONE C60, NEWS OUTDOOR, ADVERTISING AGENCY
	4 x CAPSTONE C60, CONFECTIONARY AMA
	2 x CAPSTONE C60, MYTISHCHINSKAYA TEPLOSET
	2 x OPRA GENSETS, MOSCOW-CITY PROJECT
Naryan-Mar	6 x CAPSTONE C60, NARYAN-MAR NEFTEGAZ
Nikolayevsk-on-Amur	22 x CAPSTONE C30, FAR EASTERN GENERATING COMPANY
Pervouralsk	4 x CAPSTONE C65, UNIKOM
Perm	1 x CAPSTONE C30, PERM MOTORS
Rostov-on-Don	1 x CAPSTONE C30, ROSTENERGOCOMPLEX
Ryazan	6 x CAPSTONE C60, EKA-97 NONWOVEN FABRIC PLANT

Saint-Petersburg	30 x CAPSTONE C60, IGORA SKI RESORT
	8 x CAPSTONE C65, IGORA SKI RESORT, SECOND EXTENSION
Saratov	22 x CAPSTONE C30, VOLGANEFTEGAZ
Sarov	14 x CAPSTONE C65, INSTITUTE FOR SCIENTIFIC RESEARCH
Skovorodino	9 x CAPSTONE C30, DIGITAL TRANSMISSION LINE
Smolensk	8 x CAPSTONE C60, TASIS-AGRO
Sochi	4 x CAPSTONE C60, KRASNAYA POLYANA SKI RESORT
	4 x OPRA GENSETS, GAZPROM
Tomsk	4 x INGERSOLL-RAND GENSETS (250 KW EACH), SOBOLINOE
Tyumen	12 x CAPSTONE C65, THE PEARL OF SIBERIA WINTER SPORTS CENTER
	10 x CAPSTONE C65, CENTRAL SPORTS AND RECREATION COMPLEX
Uhta	3 x CAPSTONE C65, APIS-PLUS
Khanty-Mansiysk	1 x CAPSTONE C60, KHANTYMANSIYSKNEFTEGAZGEOLOGY
	3 x CAPSTONE C30, URALSVYAZINFOM
Yakutsk	5 x CAPSTONE C60, SAKHA-TORG
	9 x CAPSTONE C30, ROSTELECOM

SOLUTIONS FOR ON-SITE POWER SUPPLY:
TELECOMMUNICATIONS

PROBLEMS OF THE SECTOR

The development of new territories, building lines of communication in remote areas, the poor condition of the existing infrastructure. Introduction of digital technologies, capacity of communication channels increase, expansion of the services range, installation of new equipment in telecommunication centers resulted in increased energy consumption. Laying power lines along with communication lines is very costly method and use of traditional isolated generators (diesel and gas reciprocating generators) is not viable due to the need of direct control, maintenance and frequent repair in remote and inaccessible locations.

SOLUTION

Compact microturbine power plants from BPC Power Systems can be controlled remotely and do not require frequent maintenance and significant operating costs.

BENEFITS

Reliable independent source of electricity, which does not require the presence of staff. Long intervals between maintenance services; system of remote control and monitoring.

Digital transmission line

On-site power plant:
9 Capstone C30 microturbines

Typical energy consumers

Telecommunication companies

Cellular operators

Similar projects

Uralsvyazinform

SKOVORODINO-YAKUTSK DIGITAL TRANSMISSION LINE

In 2005, BPC Energy Systems by the request of OAO “Rostelecom” has supplied 9 Capstone C30 microturbines for the telecommunications facility Skovorodino-Aldan-Yakutsk. Digital transmission line Skovorodino-Aldan-Yakutsk has length of 1035 km and is constructed using an optical cable and radio-relay. The new line was a response to constraints of time. Owing to this line reliability and quality of international communications in the region increased, as well as the speed of Internet access, also, a foundation for the development of telemedicine, distance education, and IP-TV was established. Capstone diesel microturbines in special enclosures suitable for work in harsh weather conditions of tundra are located at the nodal points of the digital transmission line.

Stand-alone microturbine power plants from BPC Energy Systems provide an effective solution to supply of power for local consumers without access to the utility grid. Currently, more than 70% of the territory of Russia faces the problem of power supply.

KHANTY-MANSIYSK BRANCH OF URALSVYAZINFORM

As a result of technical modernization and the significant increase of the range and types of services OAO “Uralsvyazinform” needed the reliable power source for automatic radio stations located far from the electric grids. Solution, proposed by BPC Power Systems, is based on the state-of-the-art Capstone microturbine generators. Commercial operation of microturbine generator began in February 2004 at one of the radio stations 60 kilometers away from the Khanty-Mansiysk.

Compact 30 kW microturbine power plant Capstone C30, running on diesel, provides power for remote radio relay station. The choice of Capstone C30 power unit is based on its advantages over in comparison with other sources of electricity in the same range of power.

C30 is a compact and light-weight gas turbine generator with low emissions and nose level. The microturbine has virtually no vibrations, which is important for safety of expensive and sensitive equipment located nearby. Capstone microturbine does not require lubrication and cooling fluids; it is simple and reliable to operate and intended to work at 98% load throughout the year. Capstone microturbine control system allows fully automatic operation. To improve reliability enclosure contains two Capstone C30 turbines operating in accordance with program. At any given moment an idle unit is a back-up for the operating one.

On-site power plant for radio relay station

Configuration:
2 Capstone C30 microturbines

Typical energy consumers

Telecommunication companies

Relay line operators

Similar projects

Rostelekom

SOLUTIONS FOR ON-SITE POWER SUPPLY:
AGRICULTURE, FOOD INDUSTRY

PROBLEMS OF THE SECTOR

High charge of connection to utility grid. Absence of well-trained personnel in countryside. Need for power and heat supply. Bad environmental situation and increase of penalties connected with rapid accumulation of biological waste in the process of the agricultural production.

SOLUTION

Microturbine power plants proposed by BPC are energy-efficient and easy to operate power equipment and an ideal source of power for agriculture. Microturbines are also the most state-of-the-art and economical solution to the utilization of biological waste. Modules of pyrolysis or anaerobic gasification of biological waste in combination with microturbines are capable of almost entirely recycling environmentally hazardous waste generating at the same time power and heat for the needs of agricultural facilities.

BENEFITS

Microturbine based distributed generation plants allow private farms to process products at remote locations without access to electric grids. Cogeneration — utilization of thermal energy of exhaust gases — provides significant savings compared to the utility grid tariffs. Microturbines are able to consume low-BTU and pyrolisis gases with variable content and do not require complex gas preparations.

Dairy plant

On-site CHP-plant:
8 Capstone C60 natural gas microturbines

Typical energy consumers

Greenhouses

Farms

Food factories

Similar projects

AMA confectionary

DAIRY PLANT

In summer the of 2006, one of the most advanced reprocessing facilities in the Smolensk region was built. The Governor of the Smolensk region Victor Maslov and Minister of Agriculture Alexei Gordeev participated in the opening ceremony of the new dairy plant Tasis-Agro.

"The Russian Government realizes that the revival of Russian village depends precisely on production of milk and meat" — stated the head of the Ministry of Agriculture at the opening ceremony, noting that the Smolensk agriculture's future relies on such holdings.

The modern animal husbandry complex consists of two farms (500 heads of cattle), calf-house, milking parlor, maternity ward, silo trenches, water and power supply systems.

Power supply is provided by 8 Capstone C60 natural gas microturbine power units.

In 2003, OOO "Tasis-Agro" received an investment credit from Sberbank for the purchase of equipment, including microturbines, for construction of plant with daily productive capacity of 250 tons of milk. In several years the single facility turned into a holding company that produces traditional products (milk, sour cream, cottage cheese made from natural milk) as well as a wide range of solid and processed cheese.

Capstone microturbine power plants can be successfully used to provide power and heat for the housing sector and industrial enterprises in rural areas. This unique equipment is able to effectively burn a wide range of fuels — natural gas, liquefied gas, biogas, pyrolysis gas, diesel and biodiesel. Microturbines are easy to operate and maintain and highly automated. They are capable of performing 24/7 operation within a full range of power (from 1% to 100% of nominal power).

AMA CONFECTIONARY

In December 2006, BPC Power Systems completed commissioning of Capstone microturbine-based trigeneration power plant to supply new confectionery factory with power and heat.

Installation of the on-site power plant was determined by high cost of connection to utility grid, as well as the need to ensure reliability and continuity of energy supply (including heating and cooling) for production lines. When choosing a contractor and equipment are taken into account the following considerations:The following factors were decisive in the choice of equipment and contractor:

Economic factors: High operating costs for maintenance of gas reciprocating engines, which were rated as an alternative to gas turbine engines due to lower cost (lower for 25%). Operating cost of gas-reciprocating power plant is more than 30 times higher operating cost of Capstone microturbine, so the difference in the initial cost of the two types of equipment levels during a year and a half of operation. The realized project covered its cost in 4 years.

Environmental factors: Low emissions (NO_x – 9 mg/m^3, CO – 46 mg/m^3) and a low level of noise. Small and lightweight rotor of turbine engine with the air bearing suspension is wear-proof and has incomparably long operation life. Microturbine has no vibration. Sound pressure without additional sound insulation doesn't exceed 70 dB at a distance of 10 m. The noise consists primarily of high frequency waves, which do not penetrate through walls and barriers, in contrast to the low-frequency vibrations of gas reciprocating engines.

Technological factors: Microturbines are capable of working at low loads for unlimited period of time; life time of microturbine to overhaul is 7 years. Power plant consists of 4 Capstone C65 ICHP (with integrated heat recovery module) microturbines and gas-fired boilers with total power output of 260 kW. Trigeneration mode of operation serves the following needs:

- Electrical energy powers production facilities.
- Thermal energy heats production premises.
- Cooling is used in work of refrigerating equipment.

Supply, installation, contract supervision and commissioning were accomplished in 7 months (May-December 2006). In connection with the expansion of production BPC Power Systems installed 2 additional Capstone C65 microturbines in 2007.

Confectionary factory

On-site power plant:
6 Capstone C65 natural gas microturbines

Configuration includes an absorption chiller

Typical energy consumers

Greenhouses

Farms

Food factories

Similar projects

Tasis Agro dairy plant

SOLUTIONS FOR ON-SITE POWER SUPPLY:
OIL AND GAS INDUSTRY

PROBLEMS OF THE SECTOR

Development of new oil fields can not be carried out without appropriate infrastructure. And power supply is the vital part of the oil field's infrastructure. Best part of the developing oil fields is situated in remote locations so the construction of power supply lines seems to be almost unreal. The most common method of power supply of new fields is the use of diesel generators which are usually outdated, unreliable, inefficient, requiring continuous maintenance and frequent repairs, and – what is most important – delivery and storage of expensive fuel. Attempts to burn the wellhead gas in reciprocating generators for electricity generation often fail, because of stringent requirements for wellhead gas processing and restrictions on its component composition to make it suitable for burning in reciprocating generator.

SOLUTION

OPRA and Capstone turbine power plants are able to consume wellhead gas almost without preliminary gas preparation (only a mechanical cleaning in separator filter). Wide range of power output — from 30–100 kW to 2–10 MW — allows user to install power plants of required capacity in close proximity to the loads and gas source, thus eliminating the need in gas gathering and transportation. Power plants in arctic enclosures are available; they are fully autonomous, durable, reliable and extremely easy to maintain.

BENEFITS

Gas turbine generator sets and microturbines from BPC Power Systems can be used as the main power source for remote sites utilizing the wellhead gas, which would be burnt in atmosphere instead. Gas processing or gathering are not required.

Tedinsk oilfield mini-CHP plant

On-site CHP-plant:
2 OPRA gas turbines
burning wellhead gas

Typical energy consumers

Oilfield and associated infrastructure

Similar projects

Naryan-Mar Neftegas, Naryan-Mar

Tatex, Tatarstan

TEDINSK OIL FIELD

In the summer of 2005, an on-site power plant was put into service at Tedinsk oilfield owned by Lukoil-Sever. The project was realized in cooperation with the general designer of oilfield equipping Perm'NGPIneft Institute, Globalstroi-Engineering and energy service department of Lukoil.

In connection with a significant increase in oil production Lukoil North management decided to install an on-site power plant to meet the needs of oil fields in reliable power supply. The opportunity to utilize associated petroleum gas for power generation also was an important factor. OPRA turbo generators are fitted with gas turbine engines with a radial type turbine in a form of a monowheel made of high-temperature nickel alloy, have a simple single shaft design and are intended to use associated petroleum gas with high H_2S content. They have a low service labor input, a good service life, low volume of expendables, including lubricating oils, air-cooling; small overall dimensions and reasonably low weight, and good dynamic characteristics in a wide range of fluctuating loads.

The on-site power plant consists of two bi-fuel OPRA power-generating units. The generators consume associated gas or diesel, these allow automatic switching to reserve fuels in cases of emergency.

The power units operate in cogeneration mode generating supplying oil-field with electricity and housing premises with heat. They are equipped with heat-exchangers and generate about 2 MW of electric power and 3.4 Gcal of heat in design condition.

The launch of the power plant was performed in record-breaking short terms. This was done thank to high operational compatibility of the units.

Gazprom's requirements for reliability of power plants used at its facilities are very stringent. During all the years of partnership our company has always maintained top quality and reliability of supplied power equipment compliant with Gazprom highest industry standards. To date, BPC Power Systems installed more than 20 gas turbine power plants at the facilities of Gazprom.

Capstone and OPRA gas-turbine power plants provide reliable power supply in the Far North. Partnership between our companies continues and develops.

YUZHNO-RUSSKOE GAS-CONDENSATE FIELD

BPC Power Systems have built a power plant for Severneftegazprom, which provides commercial needs of Yuzhno-Russkoe deposit.

The decision to build an on-site power plant was made because of total absence of power supply infrastructure, including power lines.

BPC Power Systems was chosen as the contractor for the delivery, installation and start-up operations of the power plant.

Equipment for power center included 7 OPRA gas turbines and 7 waste-heat boilers. This equipment is grouped into power blocks and placed in specially designed enclosures.

The power plant operates in cogeneration mode (combined production of heat and power). Thermal energy is used for hot water supply and premises heating.

OPRA gas turbine power plants supplied by BPC Power Systems fully meet the requirements of Severneftegazprom and characterized by the following main features: ability to burn unstripped gas, ease of operation, a high degree of automation, environmental friendliness, ability to work within a wide range of loads, modular design, and scalability, i.e. ability to gradually expand power output of the plant.

Yuzhno-Russkoe gas-condensate field

On-site power plant: 7 OPRA gas turbine generator sets

Typical energy consumers

Pipeline distribution systems

Gas and gas-condensate fields

Booster stations

Oil-gas fields and associated infrastructure.

Similar projects

Far Eastern Generating Company, Nikolayevsk-on-Amur.

Kavkaztransgtas, North Caucasus

SOLUTIONS FOR ON-SITE POWER SUPPLY:
WELLHEAD GAS UTILIZATION

PROBLEMS OF THE SECTOR

Every year more than 100 billion cubic meters of associated gases are burnt around the world. These gases are production waste (chemical, metallurgical industry), or extracted along with the production of mineral resources (oil, coal). Until recently, due to the lack of efficient technologies and equipment the use of such gases was economically unviable. Major problems and costs are associated with the gas preparation for its use with traditional equipment, such as gas reciprocating engines and industrial gas turbines. Gas preparation is a very expensive process and requires the construction of gas gathering facilities, gas transportation systems, and power transmission lines.

SOLUTION

Modern power plants based on Capstone microturbines and OPRA turbines are able to burn associated gases, without specialized preparation (after mechanical separation) — low-BTU gases, wet natural gases up to LPG, sour gases (up to 7% of H_2S), as well as the gases of variable composition and BTU content. The power plant's output can be chosen strictly according to the needs in electricity or to the available gas reserves — there are no problems of gas gathering and transportation of natural gas and generated electricity.

BENEFITS

High economic efficiency is reached through the utilization of associated gas and low cost of its preparation and gathering. Environmental friendliness. Reliable operation of gas turbine power plants against variable wellhead gas content.

Vakhitovskoe oilfield

On-site power plant:
5 OPRA gas turbine generator sets burning wellhead gas

1 stand-by OPRA gas turbine generator set burning diesel

Typical energy consumers

Oilfields

Similar projects

Lukoil oilfields

VAKHITOVSKOE OILFIELD

At the end of 2005, the first stage of power plant at Vakhitovskoe oilfield was put into commercial operation.

The core of the power plant is the OPRA generator set with new generation radial-type turbine engine. The engine is able to burn associated petroleum gas. There is no need for the installation of a complex gas preparation system, because engine is able to consume a wide range of gas fuels with different content, including gases with relatively high sulfur content, and BTU value.

The first stage of power plant equipment includes OPRA generator set, switchgear, transformer substation, control and monitoring booth. Power plant operates in stand alone mode without connection to any other source of energy. A gas booster is used for gas supply assistance. OPRA gas turbine unit burns gas with methane content of 26% (by mass) without any preparation procedures. The generated energy is used for driving asynchronous motors of the main oil production equipment, including bottom pumps, oil gathering systems, pipelines, and various auxiliary systems.

The project provided for the gradual expansion of the power plant capacity. In 2006, BPC Power Systems installed three more OPRA generator sets.

In 2005-2007 BPC Power Systems installed 10 power plants with power output from 2 to 20 MW, consuming associated petroleum gas. Modern power plants based on Capstone microturbines and OPRA miniturbines are able to burn associated gases without specialized preparation — low-BTU gas, wet gas, sour gas, and wild gasoline. During the implementation of such projects, BPC Power Systems has accumulated considerable experience in finding solutions to the complex tasks in the sphere of associated gas utilization.

ASSOCIATED PETROLEUM GAS UTILIZATION

BPC Power Systems have installed a state-of-the-art automatic power plant for the power supply to one of the Tatex facilities. The core of the new plant is the Capstone C30 microturbine. Microturbine burns unprepared associated sour gas with high H_2S content (more than 4%).

Generated power is used for auxiliary needs of the oilfield. Operation of the power plant benefits a lot to environmental situation dramatically decreasing emissions of harmful substances into atmosphere. This is a bright example of how BPC power Systems implements innovative technologies in power generation industry.

Tatex is one of the first joint Russian-American businesses in the oil industry and was established in November 1990. The company name is composed of the starting letters of the founders' names — the Russian Tatneft and the U.S. Texoil. The main goal of the new venture is the introduction of innovative technologies in oil production.

Oilfield

On-site power plant:
1 Capstone C30 microturbine burning wellhead gas

Typical energy consumers

Oilfields

Similar projects

Lukoil oilfields

SOLUTIONS FOR ON-SITE POWER SUPPLY:
SPECIAL PROJECTS

BPC Power Systems offers power and heat supply solutions for the most complex and non-trivial applications. As an engineering company we are ready to perform all the works connected with the power plant installation: technical and economic assessment, engineering, coordination, equipment supply, construction works, commissioning, and maintenance. Also, we can give some of our duties to our regional partners or act as subcontractors in more complex projects. Among our customers are various industrial enterprises, which are unable to connect to the electric grid for one reason or another. We find individual approach and special innovative solutions to satisfy each of our customers.

MOBILE CAPSTONE POWER PLANTS AT OILFIELD

Toboy oilfield

Mobile power plant:
2 Capstone C60
microturbines

NARYANMARNEFTEGAZ. TOBOY OILFIELD.

The mobile microturbine power plant is the transportable equivalent to the stationary power plant. Mobile Capstone power plants have some advantages over stationary ones: compact size and ease of transportation significantly simplify the installation process in the selected location and further movement. Operation of the mobile microturbine power units demands very few coordination with regulatory authorities. Maintenance and repair of Capstone microturbines can be performed in an open area and do not require significant material and human resources.

Implementation of new power generating equipment — Capstone microturbines — is connected with the need in reliable power at remote locations with insecure power supply, especially during peak hours.

BPC Power Systems created mobile power plant based on 2 Capstone C60 microturbines. Now the microturbine power plant functions in a parallel mode with the diesel generator, providing independent power supply of objects of oilfield infrastructure.

MODERNIZATION AND RECONSTRUCTION OF CITY THERMAL POWER STATION

FAR EASTERN GENERATING COMPANY

End user and customer: Far Eastern Generating Company (FEGC)

Project essence: change of the combustion system of the city thermal power station so it will burn natural gas instead black oil fuel (present annual consumption of 130 000 tons). Insertion of new pipe string in the existing gas pipeline Oha (Sakhalin) — Komsomolsk-on-Amur (the Khabarovsk territory) is made in area near De Kastri, then the gas pipeline line will pass to settlement Bulava and further along the Amur river through Bogorodsky to Nikolaevsk-on-Amur. Total length of the pipeline — 225 km.

Special technical solution by BPC Power Systems: 11 blocks containing 2 Capstone C30 (main and stand-by) each.

Consumers: block valve stations, electrochemical protection and remote metering systems.

Gas pipeline

On-site power plants: 22 Capstone C30 microturbines in enclosures, consuming natural gas and diesel.

GAS SUPPLY FOR CAUCASIAN REGION

KAVKAZTRANSGAZ. DZUARIKAU SETTLEMENT GAS PIPELINE.

End user and customer: Kavkaztransgaz (KTG)

Project essence: establishment of gas supply system in North and South Ossetia. The gas pipeline will be laid through Kudarsky pass reaching a point of 3148 meters above sea level. Almost half of the line will lie at height over 1500 meters. It is the most high-altitude gas pipeline in the world; its length is 163 kilometers 200 meters!

Special technical solution by BPC Power Systems: 9 blocks containing 2 Capstone C30 (main and stand-by) each.

Consumers: block valve stations, electrochemical protection and remote metering systems.

Gas pipeline

On-site power plants: 18 Capstone C30 microturbines in enclosures, consuming natural gas and diesel.

BPC POWER SYSTEMS — PROVIDED SERVICES

Along purchasing our power plants you get not only reliable source of power and heat, you also get qualified services. Services provided by BPC Power Systems include:

- Check of existent power supply facilities
- Front End Engineering and Design — technical and economic assessment
- Assessment of environmental attributes of power plants
- Power plant designing with the following documentation approval, critical design review and project commissioning to state supervisory bodies
- Shipment of main and auxiliary equipment
- Construction arrangements of a CHP-plant
- Arrangement of works on production and construction of turbine houses or enclosures
- Installation of thermal, electrical and control equipment
- Power plant commissioning
- Digital control system installation and adjustment
- Turnkey operation of a power plant
- Implementation of resource saving technologies
- Provision of financing management of projects

All works are carried out by qualified BPC Power Systems engineers. Well timed execution of maintenance is achieved through the network of regional service centers with warehouses.

PRODUCT QUALITY

- BPC Power Systems received ISO 9001:2000 quality management system certificate in 2004
- BPC Power Systems received GOST R 9001 – 2001 quality management system certificate in 2007
- All BPC Power Systems products are certified

CERTIFICATES AND LICENSES

- License from the State Firefighting Service
- Permission from the Federal Service for Environmental, Technological and Nuclear Supervision
- Gosstandard compliance certificate
- Quality management system compliance certificate
- License for design of buildings and structures of responsibility levels I and II
- License for construction of buildings and structures of responsibility levels I and II

EQUIPMENT AND COMPONENTS FOR CHP-PLANTS

Capstone Turbine Corporation

BPC Power Systems is the official partner and exclusive distributor of Capstone in Russia, CIS and some other countries. Capstone Turbine Corporation is the world's leading clean technology manufacturer of microturbine energy systems with unit power output from 30 kW to 1000 kW. Capstone produces all components for microturbine units: gas turbine engines, generators, control systems and performs in-plant assembly of the units. Capstone microturbines are the ideal solution for power supply to housing and public utilities, office buildings, shopping malls, sports complexes, remote oil and gas deposits, pipeline infrastructures. Also, Capstone microturbines can be used in projects on biogas and wellhead gas utilization.

OPRA Turbines

BPC Power Systems is the official partner and exclusive distributor of OPRA. The Netherlands company OPRA Turbines specializes in design and production of the state-of-the-art 2 MW gas turbine engines. Primary consumer of OPRA gensets is oil and gas industry.

Kawasaki

BPC Power Systems is the official partner and exclusive distributor of Kawasaki. Under terms of partnership BPC Power Systems supplies, installs and carries out maintenance of Kawasaki turbine sets with power output from 6MW to 17 MW. High-quality electricity and high temperature heat make Kawasaki gas turbines ideal for use in wide range of industrial applications. Due to high unit power output these turbines can be used as a part of large power plants with power output of 50-100MW during reconstruction of city CHP-plant or new construction.

BPC actively cooperates with Russian manufacturers of auxiliary equipment and components.
Also, the Company develops its own production capacities in Tutaev, Yaroslavl region.
Now, we can offer the following equipment made by Russian manufacturers:

- Exhaust systems and heat recovery units
- Fire protection systems for turbines
- Gas booster compressors
- Coolers and climatic equipment
- Automatic control systems for heat recovery units
- Shutoff valve blocks
- Boilers and enclosures

MAIN TECHNICAL CHARACTERISTICS OF GAS TURBINES AND MICROTURBINES CHP-PLANT BPC POWER SYSTEMS

ITEM	CAPSTONE C30	CAPSTONE C65	CAPSTONE C200	CAPSTONE C1000*	OPRA
Power output, kW	30	65	200	1000	1800
Power efficiency, %	26±2	29±2	33±2	33±2	27,8
Total efficiency (considering cogeneration), %	80	80	66–80	66–80	90
Operating voltage range, kV	0.38–0.48	0.38–0.48	0.38–0.48	0.38–0.48	0.4; 6.3; 10.5**
Peak phase current, A	46	100	275–290	1 450 A (400 V)	150 A (10 kV)
Frequency, Hz	50	50	50	50	50
Weight, kg	578	1121	3 180–3 640	12 927	23 000
Length x Width x Height, mm	1516 x 762 x 1943	1956 x 762 x 2110	3660 x 1700 x 2490	9144 x 2438 x 2896	7550 x 2100 x 2600
Fuel	Natural gas, kerosene, diesel	Natural gas, kerosene, diesel	Natural gas	Natural gas	Natural gas, kerosene, diesel
Operating inlet pressure, bar	3.8	5.6	5.1	5.1	12.5
Fuel consumption at nominal power, Nm^3	12	23	65	325	711 Nm^3 – gas; 670 l/h – diesel
Exhaust temperature, °C	275	309	280	280	555
Thermal output, kJ/h (Gcal/h)	305 000 (0.073)	591 000 (0.141)	1 420 000 (0.339)	7 100 000 (1.696)	14 400 000 (3.44)
Emissions (at 15% O_2)	< 9 ppmV NO_x	< 9 ppmV NO_x	< 9 ppmV NO_x	< 9 ppmV NO_x	< 20 ppmV NO_x
Noise level (at a distance of 10 m), dBA	65	65	65	65	80
Turbine rotation speed, rpm	96 000	96 000	96 000	96 000	26 000
Overhaul life, hours	60 000	60 000	60 000	60 000	60 000

* Capstone C600 and C800 have similar characteristics

** Depends on generator model

Client testimonials

“In 2007 power plant consisting of 6 Capstone microturbines with heat recovery modules and gas boilers was commissioned by engineers of BPC Power Systems. Having considered proposals of various suppliers the decision was made in favor of BPC Power Systems. The main factors that determined our choice were: short terms of commissioning, modularity and mobility of power units, and unique environmental features. Low cost of maintenance and spare parts, ability to burn wide range of fuels, and fast payback period. Subject to operational needs, commissioning of the power plant was performed in extremely short terms — interconnection of microturbines and correspondent utilities, installation supervision and start-up were done in 7 months. Highly qualified BPC specialists solved all technical issues promptly and effectively, as a result the project fully complies with technical requirements, specifications and guidelines. Management of AMA-Pavlovskoe highly appreciates level of design, construction and erection works performed by BPC Power Systems.”

V.S. Osipov
General director
AMA-Pavlovskoe, Moscow Region

“Power units supplied by BPC — 8 ultra modern Capstone microturbines — are very reliable in operation and provide power and heat for livestock breeding complex, which includes two calf sheds and milking room. Since putting power plant into operation in summer 2006 we have never experienced failures of power supply.”

V.A. Yushkov
President
Tasis-Agro, Smolensk

“In connection with business expansion, realization of new production projects and need in uninterruptible heat and power supply management of Sakha-Torg decided to build own power plant. BPC Power Systems was chosen as a development partner and supplier of the main equipment.

Qualified specialists of BPC Power Systems performed commissioning, start of operation and staff training. Preparation of the site and installation of power equipment were made by energy department of Sakha-Torg. Microturbine CHP-plant was put into operation in July, 2004.

Company management witnesses that BPC power Systems has highly qualified personnel with great experience in realization of such projects and highly appreciates level of organization and performed works.”

V.E. Nosov
Chief Power Engineer
Sakha-Torg, Yakutsk

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