55 years

NOVO-RYAZAN CHP PLANT

Light and heat to every home!

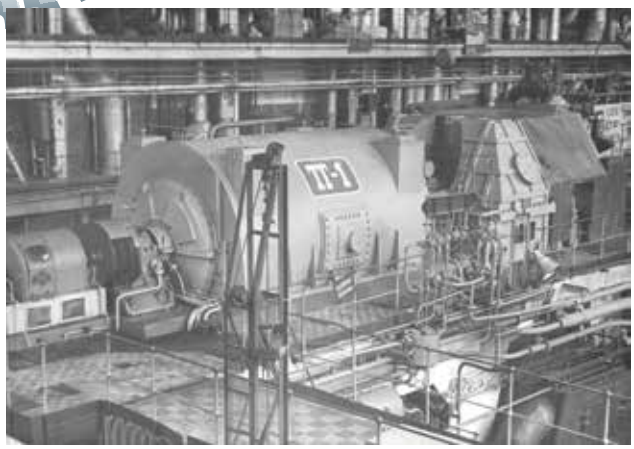

Light and heat to every home!

NOVO-RYAZAN CHP PLANT IS THE LARGEST COMBINED HEATING AND POWER PLANT IN RYAZAN

The Ryazan branch of Novo-Ryazan CHP Plant LLC is the largest producer of thermal and electric energy in Ryazan. The CHP Plant holds great social importance due to the amount of thermal power provided to the regional center – the combined heating and power plant supplies heat and hot water to more than 60% of the housing and public utility sphere in Ryazan, i.e. residential areas of Oktyabrsky, Zheleznodorozhny and Sovetsky districts of the regional center. Moreover, the CHP Plant supplies thermal energy – as steam – and hot water to more than 20 industrial enterprises of the South Industrial Hub. The CHP Plant's major consumers include: Ryazan Oil Refining Company CJSC (Rosneft Oil Company), KRZ Diversified Manufacturing Company CJSC, and the largest reseller of thermal energy – Municipal Unitary Enterprise "Ryazan Municipal Enterprise of Heat Supply Network".

Every year during the heating season the plant's output can fully cover the city of Ryazan's demand for electric power, and the plant generates 20% of all power consumed in Ryazan Oblast.

The main fuel used at the CHP Plant is natural gas. For peak loads periods during the heating season, residual fuel oil can be used as back-up fuel. The plant's installed electric power capacity is 425 MW, and the installed thermal power capacity is 1609 Gcal/h. For the past 10 years, the CHP Plant's installed power has increased by 25 MW (6%).



CHP Plant's first turbine generating unit. 1959

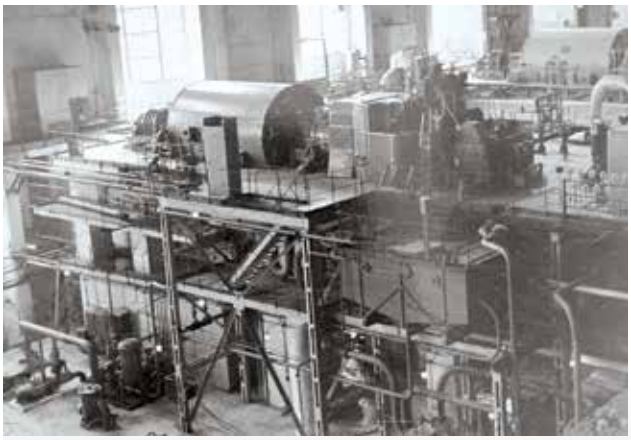
Construction of the Novo-Ryazan CHP Plant began upon the decision of the USSR Council of Ministers on July 19, 1952. The CHP Plant was to become the most important power supplier for the Ryazan refinery and chemical fibre plant and the heat supplier for residential areas of Ryazan, which were under construction at that time. The design and construction of Novo-Ryazan CHP Plant began in 1953, followed by the organisation of the "Managerial Board of Constructed Novo-Ryazan CHP Plant". Construction of Novo-Ryazan CHP Plant was performed by general contractor Construction Department #3 of the Business Organisation #23 of the Construction Ministry of the RSFSR and by general subcontractor Ryazan Branch of the Erection Department of Central Electrical Installation Business Organisation. The Ryazan office of Central Electrical Installation was entrusted to install electrical equipment. In 1955 construction of Novo-Ryazan CHP Plant was announced as Komsomol shock construction. More than 325 young men arrived for construction of the CHP Plant under Komsomol permits.

A governmental plan scheduled the commissioning of Novo-Ryazan CHP Plant for the fourth quarter of 1959. The final months of unit commissioning – August and September 1959 – were the most intense. Start-up operations were performed continuously according to an hourly schedule, and people worked day and night.

On September 26, 1959, a trial run was performed for the first turbine generating unit of the VPT-25-3 turbine equipped with TV2-30-2 Station #1 Generator following the completion of overall testing of Boiler Unit #1, type PK-14. On this day, the first turbine generating unit of Novo-Ryazan CHP Plant – 25,000 kW capacity – was synchronised and paralleled with the country's entire energy grid.

On September 30, 1959, following the completion of overall testing, the Council of National Economy of the Ryazan Administrative Economic District approved an act on commissioning the CHP Plant's first units.

Overall testing of Boiler Unit #2 was performed from December 18-21, 1959. After this, Boiler Unit #2, with a capacity of 230 tons/steam per hour, was put under commercial load. Overall testing of Turbine Generating Unit #2 was performed from December 24-27, 1959, after which it was connected to the Mosenergo grid. On December 29, 1959, the chairman of the Council of National Economy of the Ryazan Administrative Economic District approved an act on commissioning Boiler Unit #2 and Turbine Generating Unit #2.



Turbine Department. 1960s

Panorama of Novo-Ryazan CHP Plant. 1963

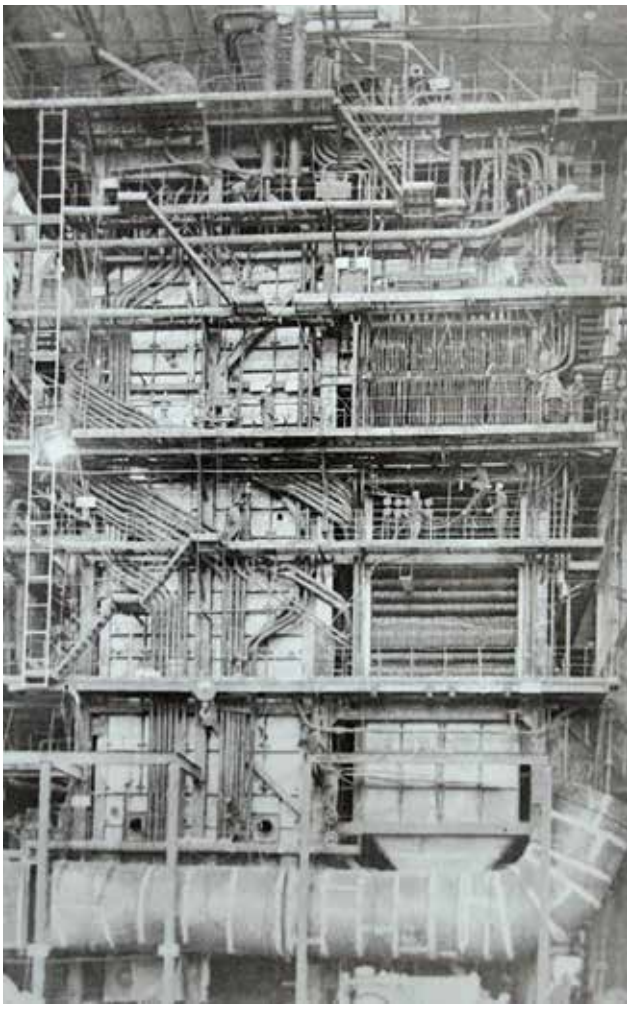
Pavel Mikhailovich Kharavin was named the first Director of the CHP Plant; Gury Ionovich Abramov – first Chief Engineer; Viktor Arefyevich Shestera – first Head of Turbine Department; Vasily Mikhailovich Fomenko – first Head of Boiler Department; Vsevolod Pavlovich Ugolnikov – first Head of Byproduct Recovery Department; Miron Alexeyevich Tutunik – first Head of Electric Department.

Power and heating supply of chemical fibre works began in November 1959. In December 1959, after bringing Boiler Unit #2 and Turbine Generating Unit #2 into operation, the CHP Plant began supplying heat to the residential area in Ryazan City Grove using Heating Main #1 "CHP Plant-City Grove". In 1960, after bringing Boiler Unit #3 and Turbine Generating Unit #3 into operation, heating and power supply of the Ryazan Oil Refinery began. In 1961, after starting up Boiler Unit #4 and Turbine Generating Unit #4, the CHP Plant proceeded with heating supply to the village of Stroitel in Ryazan and power supply to Ryazan Cardboard and Ruberoid Mill. Initially, the CHP Plant operated only on fuel oil, but following the commissioning of its own gas facility and pipeline system in December 1962, the plant began using natural gas as fuel. Heating supply of Ryazan through the second main "CHP Plant – Kuybyshevskoye Highway" began in 1968. In late 1970, following the start-up of the tenth boiler unit and ninth turbine generating unit, Novo-Ryazan CHP Plant reached its design capacity of 400 megawatts. In 1971 heating supply to the Dashkovo-Pesochnya residential district of Ryazan and power supply to Ryazan Automotive Components Plant (AMO ZIL) began.

From 1957 to 1960, the CHP Plant was a part of the Chemical and Fuel Industry Department of Ryazan's Council of National Economy. At various times from 1961 to 1991, Novo-Ryazan CHP Plant was part of Ryazanenergo and Mosenergo Regional Energy Board.

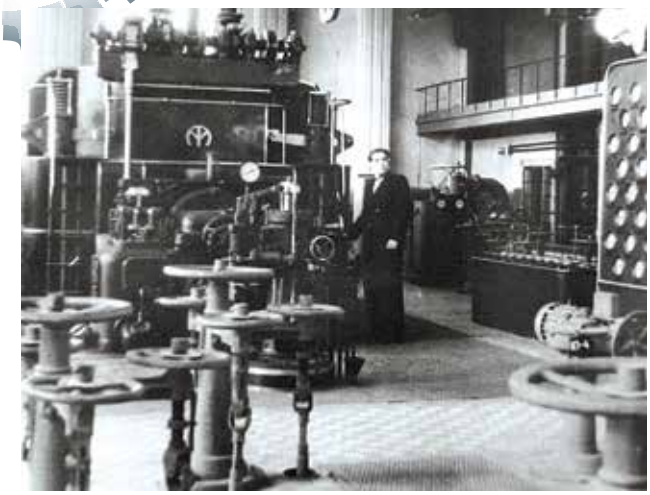
In 1991, in accordance with Order No. 78 dated April 2,1991, issued by the Ryazanenergo Production Enterprise "On leasing capital assets to Novo-Ryazan CHP Plant", the enterprise, having status as a legal identity, leased capital assets. At that moment, the leased company had operating control of independent business activity, but it was still a part of the government enterprise Ryazanenergo Production Enterprise. The company had an independent balance sheet incorporated into a summary balance sheet of Ryazanenergo.

In 1992, by decision of a Novo-Ryazan CHP Plant staff conference in accordance with the law "On Enterprises and Entrepreneurial Activity", the leased company was converted into a limited liability



Installation of TGM-84 Steam Boiler #6.
1965

Installation crew of Ryazan branch of
Central Electrical Installation business organisation on Steam Turbine #1.
1959



Turbine #1, 25 MW VPT-25 type.
At synchronizer, turbine operator N.V. Dyomin.
September 1959

partnership. Novo-Ryazan CHP Plant LLP's charter was approved at that conference. Based on Ordinance of the Supreme Council of the RF No. 3020-1 dated December 27, 1991, the Committee for the Administration of State Property of Ryazan Oblast (KUGI) and leased enterprise Novo-Ryazan CHP Plant signed an addendum to the lease contract in 1992, according to which the rights of the lessor were transferred from Ryazanenergo to the regional committee (KUGI), having rights of territorial agent of the Russian Federation State Property Committee. That same year, in accordance with Instruction No. 1100r issued by Ryazan's mayor, Novo-Ryazan CHP Plant LLP received state registration as a successor of the leased enterprise. Then, based on Russian Presidential Decree No. 1230 dated October 14, 1992, KUGI of Ryazan Oblast and Novo-Ryazan CHP Plant LLP renegotiated the lease contract in December 1992 on the same conditions as those set with the previous lessor.

In January 1993 the Russian Ministry of Fuel and Energy issued a decree on the removal of Novo-Ryazan CHP Plant from Ryazanenergo based on the division balance sheet (Russian Ministry of Fuel and Energy Decree No. 8 dated January 12, 1993). The Russian Ministry of Fuel and Energy also proposed that Ryazanenergo sign commercial contracts with Novo-Ryazan CHP Plant on buying and selling energy resources and on conditions of their parallel operation within the Unified Energy System of Russia. In practice, it meant the transition of Novo-Ryazan CHP Plant LLP to independent business activity.

Construction of Novo-Ryazan CHP Plant.
1958

Novo-Ryazan CHP Plant's Directors:

1959–1968 – Pavel Mikhailovich Kharavin
1969–1972 – Gennady Alexeyevich Yeremin
1972–1981 – Boris Alexandrovich Kozhaev
1981–1989 – Alexander Ivanovich Torgashin
1989–1999 – Alexander Vladimirovich Sokirkin
1999–2000 – Anatoly Zaribzyanovich Shestakov
2000–2002 – Valentin Yuryevich Tikhvinsky
2002–2005 – Semyon Viktorovich Sazonov
2005–2009 – Sergey Sergeyevich Rychagov
2009–2011 – Andrey Vladimirovich Bogdanov
2012 – Oleg Ivanovich Rozhdestvin
February 2013 to present – Andrey Vladimirovich Bogdanov

Novo-Ryazan CHP Plant's Chief Engineers:

1959–1967 – Gury Ionovich Abramov
1967–1989 – Grigory Konstantinovich Nachinkin
1989–1995 – Grigory Vakulovich Palamarchuk
1996–2006 – Anatoly Alexandrovich Uvorvikhvost
2006–2009 – Oleg Vadimovich Persov
2009–2013 – Georgy Vasilyevich Malyshev (Executive Director-Chief Engineer)
April 2013 to present – Sergey Yuryevich Vinogradov (Executive Director-Chief Engineer)

Lead crew of Ryazan branch of Central Electrical Installation business organisation under L.I. Chetverik during Boiler #1 installation. 1959

AWARDS

Novo-Ryazan CHP Plant received the following certificates of appreciation: Best Enterprise in its Industry, Contribution to Social Sphere Development, Effective Environmental Policy

Based on results of the Best Enterprises and Companies of Ryazan Oblast competitions held annually by the government of Ryazan Oblast and the Ryazan Chamber of Industry and Commerce, Novo-Ryazan CHP Plant was awarded Best Enterprise in its Industry in 2007, 2008, 2009, 2011 and 2012. The Combined Heating and Power Plant has received the following awards from the government of Ryazan Oblast: Most Efficient Workforce Management (2007, 2008 and 2009), Contribution to Social Sphere Development (2007), Most Dynamic Development (2008), Most Efficient Use of All Types of Production Resources (2008), Effective Environmental Policy (2009) and Consistently High Results (2009).

2011

2012

2009

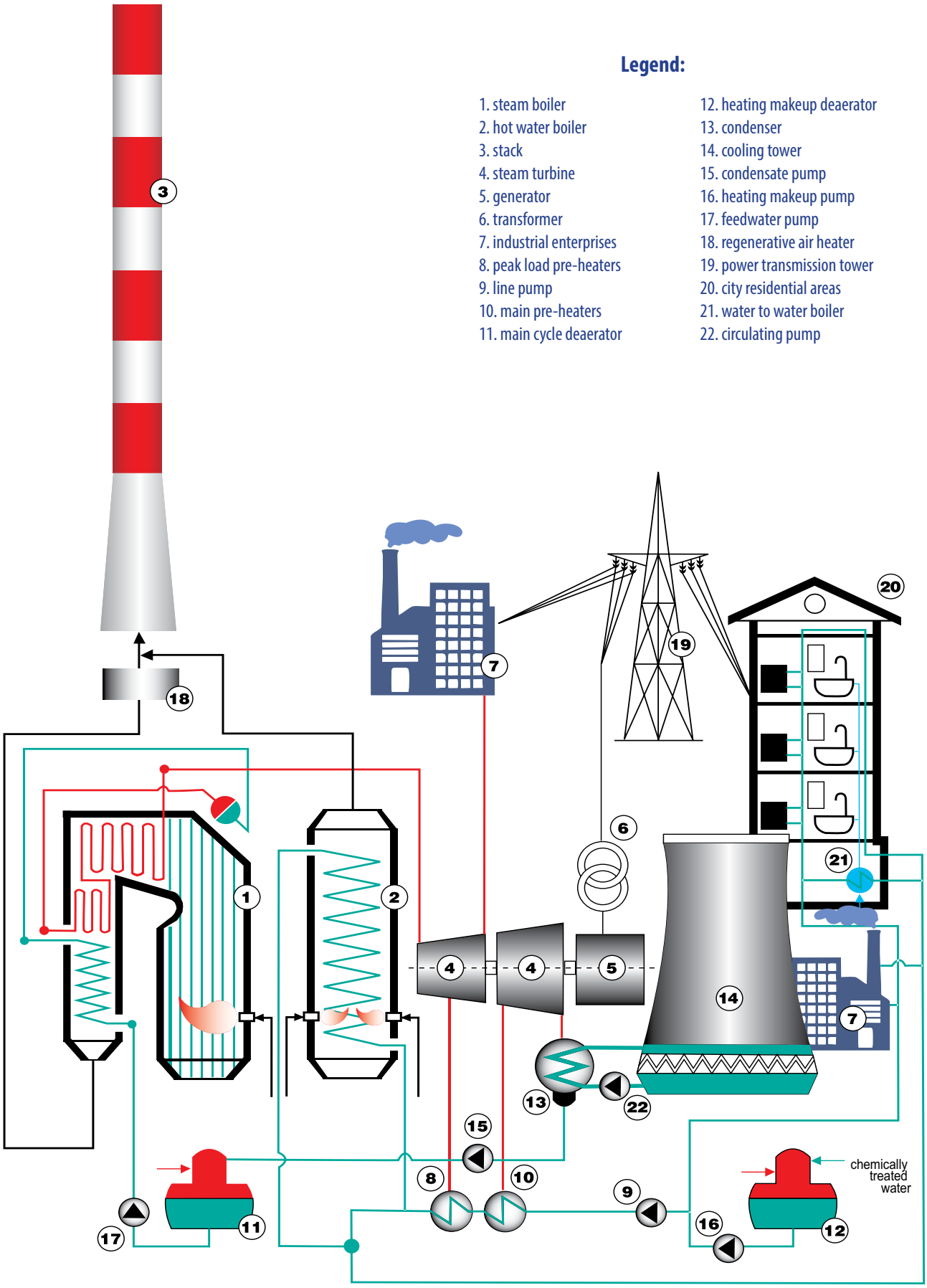
2008

2007

PROCESS DIAGRAM OF NOVO-RYAZAN CHP PLANT

Legend:

1. steam boiler
2. hot water boiler
3. stack
4. steam turbine
5. generator
6. transformer
7. industrial enterprises
8. peak load pre-heaters
9. line pump
10. main pre-heaters
11. main cycle deaerator
12. heating makeup deaerator
13. condenser
14. cooling tower
15. condensate pump
16. heating makeup pump
17. feedwater pump
18. regenerative air heater
19. power transmission tower
20. city residential areas
21. water to water boiler
22. circulating pump



Light and heat to every home!

Steam boiler (1) and hot water boiler (2) furnaces are used to burn gas and fuel oil. Exhaust fans blow combustion materials into the stack (3). Superheated steam, produced by steam boilers, is fed onto turbine blades (4), which rotate the generator (5). Generated power output is transmitted via transformer (6) into the energy system (19) for industrial enterprises (7) and residences in Ryazan (20). Part of the electric energy is used for the CHP Plant's own needs.

Steam is supplied to industrial enterprises (7) via steam lines from turbine side streams at 15 atm pressure and 280 °C. Water for the heating supply of the city and industrial enterprises is pre-heated to 100 °C in the main delivery water pre-heaters (10), where steam is fed to 2.5 atm pressure; further pre-heating is performed in peak load boilers (8) and peak load hot water boilers (2).

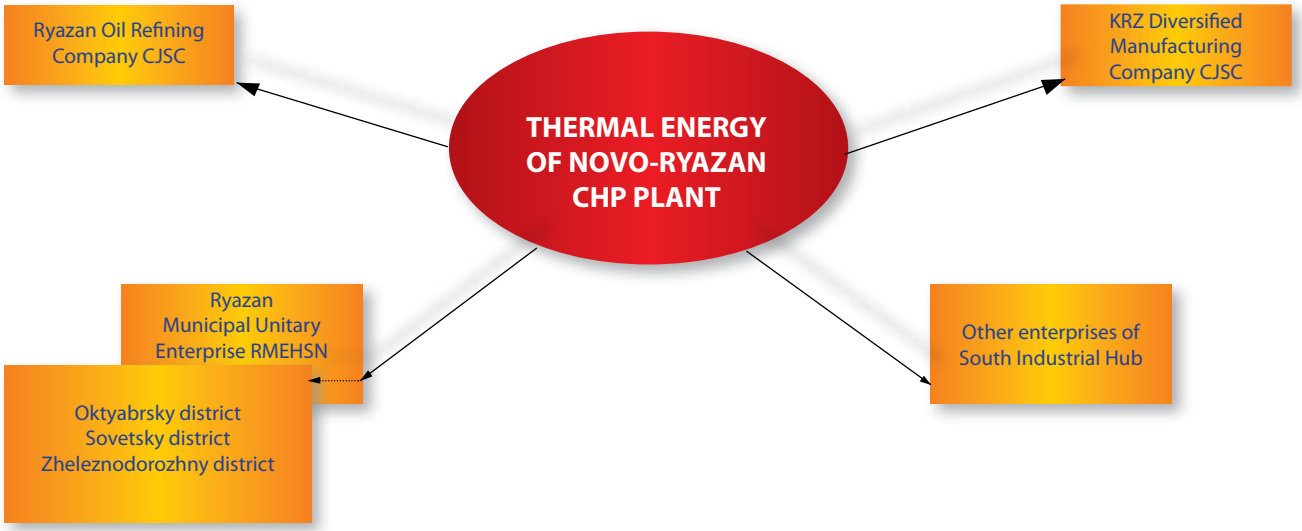
Delivery water is circulated in heating system by means of line pumps (9). Treatment of water to compensate for loss of condensate by industrial enterprises and leakage of deliver water in cogeneration systems is performed at the CHP Plant's demineralizer. Fully demineralized water is supplied through deaerators (11) into the CHP Plant's cycle to replenish condensate, while softened water moves through deaerators (12) to replenish delivery water losses in cogeneration systems. Deaerators (11) and (12) are used to degas water. Waste steam from cogeneration turbines is cooled in condensers (13) via circulating water pumped from cooling towers (14) by circulating pumps (22).

THERMAL ENEGRY OUTPUT

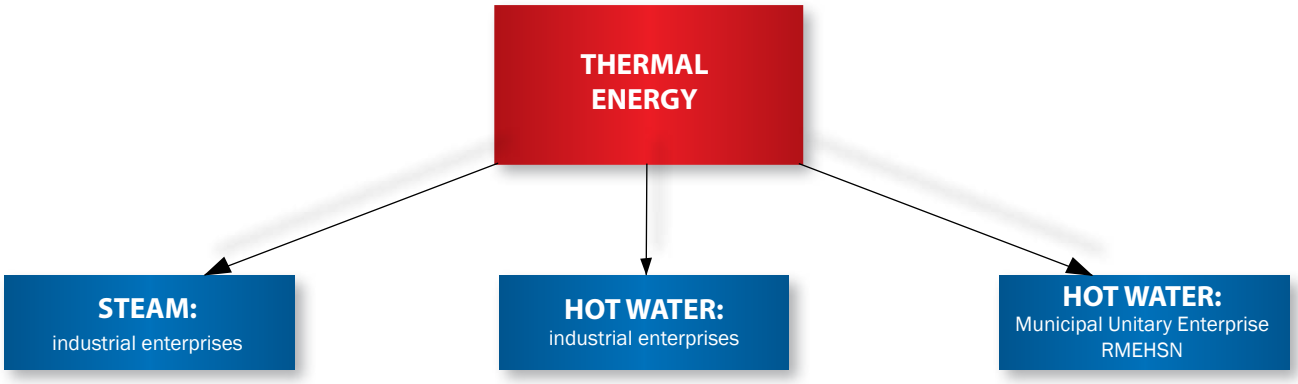
Novo-Ryazan CHP Plant supplies heat to more than 20 industrial enterprises of Ryazan's South Industrial Hub, where 11 enterprises receive heating as steam with P=15 atm and t=280 ^{0}C and 12 enterprises receive heating in the form of hot water. Moreover, Novo-Ryazan CHP Plant supplies heat to more than 60% of Ryazan residences through the networks of Municipal Unitary Enterprise "Ryazan Municipal Enterprise of Heat Supply Networks" (RMEHSN).

The installed heating power capacity of Novo-Ryazan CHP Plant is 1609 Gcal/h. The connected capacity of Novo-Ryazan CHP Plant's users is: 947 Gcal/h of hot water, 292 Gcal/h of steam. The primary users of thermal energy supplied by Novo-Ryazan CHP Plant are Ryazan Oil Refining Company CJSC (Rosneft Oil Company), KRZ Diversified Manufacturing Company CJSC and Municipal Unitary Enterprise "Ryazan Municipal Enterprise of Heat Supply Networks". Novo-Ryazan CHP Plant builds its relationships with thermal energy users on the basis of direct contracts for heating supply. Applied tariffs are approved by the Main Directorate of the Regional Energy Committee of Ryazan Oblast.

THERMAL ENEGRY USERS NOVO-RYAZAN CHP PLANT



DISTRIBUTION OF THERMAL ENEGRY GENERATED BY NOVO-RYAZAN CHP PLANT



ELECTRIC ENERGY OUTPUT

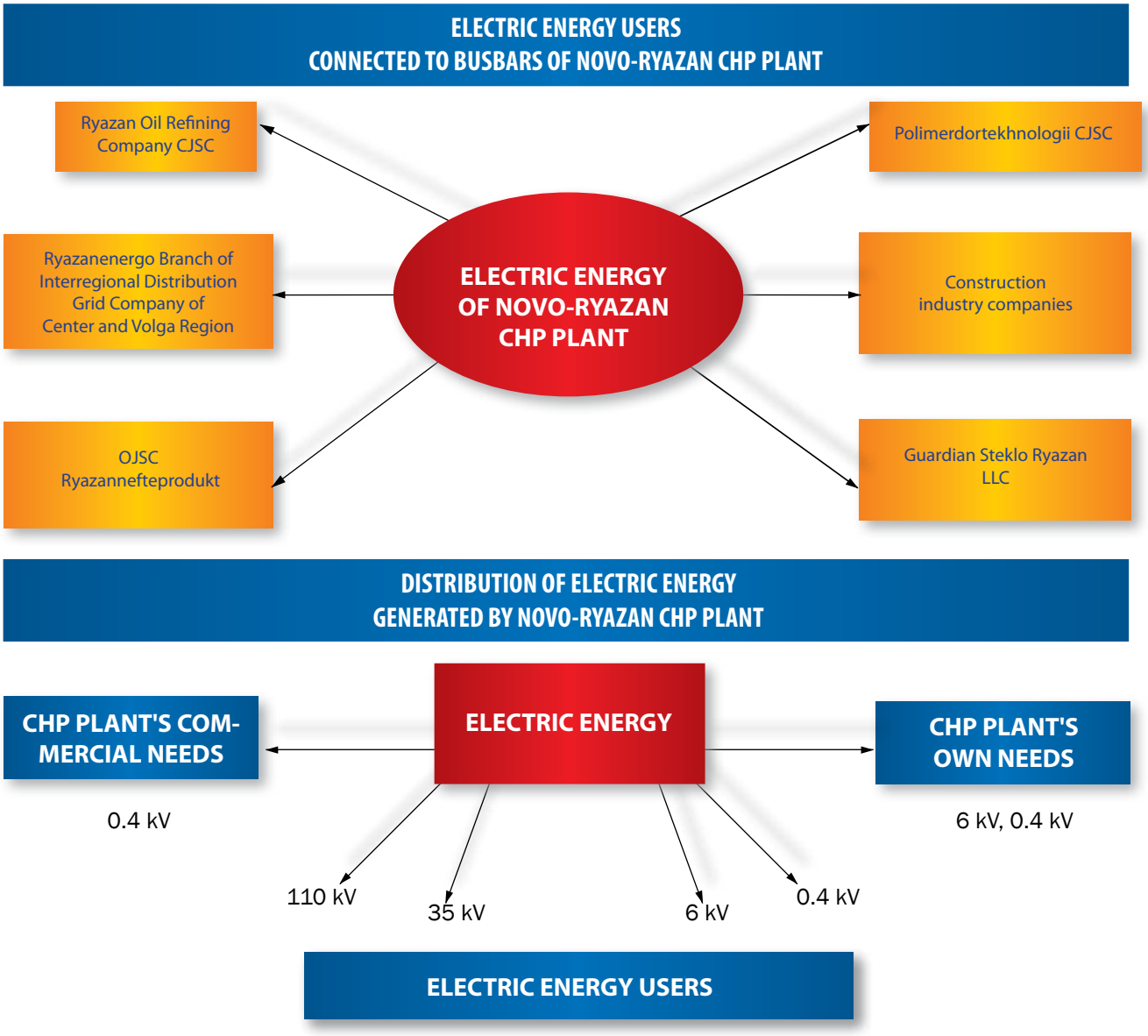
Novo-Ryazan CHP Plant's technological process provides power output via combined cycle. For this purpose, the CHP Plant is equipped with 9 steam turbines with a total electrical capacity of 425 MW. Among these are 4 back pressure turbines with a total capacity of 150 MW.

In accordance with amendments to current legislation, Novo-Ryazan CHP Plant received the status of electric power wholesale market entity on September 30, 2011, and has had access to the trade system of the electric power wholesale market since January 1, 2012.

A significant portion of power output is transmitted to the networks of the Ryazanenergo branch of Interregional Distribution Grid Company of Center and Volga Region OJSC. The remaining portion of electric energy is consumed by industrial enterprises connected directly to the CHP Plant's switchgear.

Electric energy is sold using a system of contracts with the commercial operator of the electric power wholesale market, i.e. Trade System Administrator OJSC.
Industrial enterprises directly connected to the CHP Plant's switchgear are supplied on the basis of a system of contracts with related entities of the wholesale market: default provider RESK OJSC and power supply companies EESnK CJSC and Transneftenergo LLC.

Electric power is transmitted from Novo-Ryazan CHP Plant to users from the plant's switchgears in the grid of the Ryazanenergo branch of Interregional Distribution Grid Company of Center and Volga Region by means of 110 kV power lines. Ryazan Oil Refining Company CJSC is supplied power by 110 kV, 35 kV and 6 kV power lines, Ryazantransneftprodukt OJSC and Guardian Steklo Ryazan LLC by 35 kV power lines, Polimerdortekhnologii CJSC by 6 kV power lines, and construction industry companies by 6 kV and 0.4 kV power lines.



BOILER EQUIPMENT

The main equipment at Novo-Ryazan CHP Plant consists of 8 energy boiler units and 2 peak load hot water boilers (type PTVM-180). All boilers use natural gas Q_p^H = 7800-7900 kcal/Nm^3 and fuel oil 100 Q_p^H=9300-9700 kcal/kg.

The plant has updated and modernised boilers during their service to improve the efficiency, reliability, and environmental performance of boiler units. 8 power and 2 peak load hot water boilers have a flue gas recirculation design. All TGM-type boilers are equipped with thermal wave cleaning units of rotating air preheaters; gas equipment for energy boilers is completely revamped. Boilers #6, 7 and 8 had their burners reduced from 18 to 6 units to improve reliability of operation. TGM-84 Boiler Unit #6 was updated through integration of APCS and complete modernisation of its gas facilities. A microprocessor-based automated parameter control system was installed at Boilers #1, 4, 6, 7, 8, 9, 10 and 11.

Boiler Department. Boiler Unit #1

Specification of Novo-Ryazan CHP Plant's boiler equipment

Energy boiler units

Station No.	Type	Manufacturer	Capacity, t/h	Pressure, kg/cm^2	Temperature, °C	Type of fuel	
1	PK-14R	Podolsk Works	230	100	510	fuel oil	gas
4	TGM-151	Taganrog Works	220	100	510	fuel oil	gas
6	TGM-84	Taganrog Works	420	140	545	fuel oil	gas
7	TGM-84	Taganrog Works	420	140	545	fuel oil	gas
8	TGM-84	Taganrog Works	420	140	545	fuel oil	gas
9	TGM-84	Taganrog Works	420	140	545	fuel oil	gas
10	TGM-84	Taganrog Works	420	140	545	fuel oil	gas
11	BKZ-420-140 NGM-4	Barnaul Works	420	140	545	fuel oil	gas

Peak load hot water boilers

Station No.	Type	Thermal power, Gcal/hour		Type of fuel	
		gas	fuel oil		
4	PTVM-180	180	180	fuel oil	gas
5	PTVM-180	180	180	fuel oil	gas

Boiler Department. Pump station of fuel oil facility

Boiler Unit furnace. Heat is made here

Local control switchboard for Boiler Unit #10

On the control switchboard for Boiler Unit #6

Equipment of new gas facility of Boiler Unit #6

Boiler Unit #6

TURBINE EQUIPMENT

Novo-Ryazan CHP Plant has 9 turbines installed, including three turbines with cogeneration plants, i.e. turbines #5, 6 and 9.

Two PT-25 turbines and one PT-65/75-130-13 turbine have production side streams and heat extractions. Two R-25-90 turbines and two R-50-130 turbines are of back pressure type. Certain industrial consumers are supplied with turbine-produced steam under P=15 kg/cm^2 pressure and t=280^{0}C and with hot water at a constant temperature of 135 ± 2^{0}C.

Heating and hot water are supplied to industrial consumers from the cogeneration plants of first line turbines of the Turbine Department according to a temperature chart at 130^{0}C to 70^{0}C depending on ambient air temperature. The pressure of straight pipeline is kept at 9 ± 0.5 kg/cm^2. The capacity of circulating water is 2000 t/hour. Two-turbine cogeneration plants along with boilers and peak load hot water boilers supply heat to Ryazan residences. Delivery water flow in municipal networks is 12500-13500 t/hour.

Pressure in straight mains is 14.0 kg/cm^2. The system operates according to a temperature chart at 150^{0}C to 70^{0}C (breakpoint temperature of 130^{0}C) depending on ambient air temperature. In 2003 a new 200 Gcal\h boiler unit was brought into operation at the CHP Plant to improve the reliability and efficiency of city's heating supply. In 2012 a new delivery water pre-heating unit was commissioned for Ryazan. To replenish delivery water losses, the CHP Plant was equipped with makeup deaerating plants providing 300 t/hour makeup for enterprise networks and 1200 t/hour for municipal networks. The peak increase of makeups is replenished using makeup water from accumulator tanks. The CHP Plant outputs thermal power via 500 mm diameter steam pipelines designed for 15 kg/cm^2 working pressure and t = 280°C, and via heating mains with 200-500 mm diameter for industrial enterprises and 600-1000 mm for municipal heating networks.

Turbine Department. Cogeneration Turbine #6

Specification of Novo-Ryazan CHP Plant's turbine equipment

Steam turbines

Station No.	Type	Manufacturer	Electric power, MW	Thermal power, Gcal/hour	Pressure, kg/cm^2	Temperature, °C
1	PT-25/30-8.8	Kaluga Turbine Works	25	73	90	500
2	PT-25-90	Ural Turbine Motor Works	25	73	90	500
3	R-25-8.8	Leningrad Metal Plant	25	164	90	500
4	R-25-90	Kharkov Turbine Generator Works	25	164	90	500
5	PT-65/75-130	Leningrad Metal Plant	65	139	125	540
6	T-60/65-130	Ural Turbine Works	60	100	125	540
7	R-50-130	Leningrad Metal Plant	50	188	125	540
8	R-50-130	Leningrad Metal Plant	50	188	125	540
9	T-100-130	Ural Turbine Motor Works	100	160	125	540

The CHP Plant focuses efforts on replacing physically worn and obsolete turbine units. In 1993 the PT-60-130/13 turbine at Station #5 was replaced by the modern PT 65/75-130-13 turbine. In 1995 the R-25-90 turbine at Station #3, manufactured by Kharkov Turbine Generator Works at Station, was replaced by the modern R-25-8.8/2 turbine manufactured by Leningrad Metal Plant. In 2002 the PT-25-90 turbine at Station #1, manufactured by Ural Turbine Works, was replaced by the PT-25/30-8.8/1.0-1 manufactured by Kaluga Turbine Works. In 2004-2005 the T-50-130 turbine at Station #6 was replaced by all the auxiliary equipment for a new T-60/65-130 turbine.

Microprocessor-based automated parameter control systems were installed at the makeup deaerating plant, boiler unit, Turbine Units #1, 3, 5, 6, 7, 8 and 9, and delivery water pre-heating plant.

On the control switchboard of the delivery water pre-heating plant for Ryazan

Panorama of Turbine Department

ELECTIRC EQUIPMENT

The CHP Plant outputs 6 kV, 35 kV and 110 kV electric power from enclosed switchgears. The CHP Plant's generators for Stations #1, 2 and 3 are connected via 6 kV generator switchgear busbars and 6/35/110 kV coupling transformers for Stations #1 and #2 into the unified energy system. The 6 kV generator switchgear provides the CHP Plant with auxiliary power supply via 11 feeders, while 13 feeders supply power to industrial enterprises.
Station #4 and #6 generators are connected via 10/35 kV transformer blocks to 35 kV busbars, which supply industrial enterprises via 9 feeders and output power into the energy system by three lines.

Station #5 and #7 generators are connected via 6/35/110 kV transformers #5 and #7, respectively, to 35 kV and 110 kV busbars. From the 6 kV generator voltage side, blocks have taps for the station's own power supply.

Station #8 generator is connected via transformer block to 110 kV busbar. The plant is connected to Russia's power grid via 110 kV

Power lines from CHP Plant to industrial consumers

Specifications
Novo-Ryazan CHP Plant's electrical equipment

Generators

Station No.	Type	Manufacturer	Electric power, MW	Output voltage, kV
1	TFP -25-2/6.3 UZ	«Elektrosila»	30	6,3
2	TVS-30	Novosibirsk Turbine Generator Works	30	6,3
3	TVS-30	Kharkov Elektrotyazhmash	30	6,3
4	TVS-30	Kharkov Elektrotyazhmash	30	10,5
5	TVF-60-2	Novosibirsk Turbine Generator Works	60	6,3
6	TVF-60-2	Novosibirsk Turbine Generator Works	60	10,5
7	TVF-60-2	Novosibirsk Turbine Generator Works	60	6,3
8	TVF-60-2	Novosibirsk Turbine Generator Works	60	10,5
9	TVF-100-2	«Elektrosila»	100	10,5

Transformers

Station No.	Type	Manufacturer	Power, MW	Voltage, kV
1	TDTNG-31.5/110	Zaporozhsky Works	31,5	110/35/6
2	TDTNG-31.5/110	Zaporozhsky Works	31,5	110/35/6
3	TD-40.5/35	Moscow Works	40,5	35/10
5	TDTsTN-80/110 U1	Togliatti Works	80	110/35/6
6	TDTs-80/35	Moscow Works	80	35/10
7	TDTNG-75/110	Zaporozhsky Works	75	110/35/6
8	TD-80/110	Togliatti Works	80	110/10
9	TDTs-125/110	Togliatti Works	125	110/10
9 TCH	TRDNS-25/15	Zaporozhsky Works	25	10/6

Power Transformer #5T

Exposed part of switchgear

lines outgoing from the CHP Plant. Station #9 generator is connected via transformer block to 110 kV busbar and has taps for the CHP Plant's own power supply.

The CHP Plant is equipped only with enclosed-type switchgears.

35 kV and 110 kV switchgears are equipped with 35 kV VVN type and 110 kV VVSh air-blast circuit breakers, 110 kV modern SF6 circuit breakers and 35 kV vacuum circuit breakers, and the 6 kV switchgear is equipped with oil and vacuum circuit breakers. The plant's own power is supplied from 6 kV and 0.4 kV sections. All the CHP Plant's electrical equipment is reliably protected with power system protection.

The plant is retrofitting 35 kV and 110 kV closed switchgear bays by replacing the air-blast circuit breakers for vacuum and SF6 models. 6 kV and 0.4 kV switchgears are systematically replaced with modern metal-clad switchgears.

CHP Plant's main control board

WATER TREATMENT

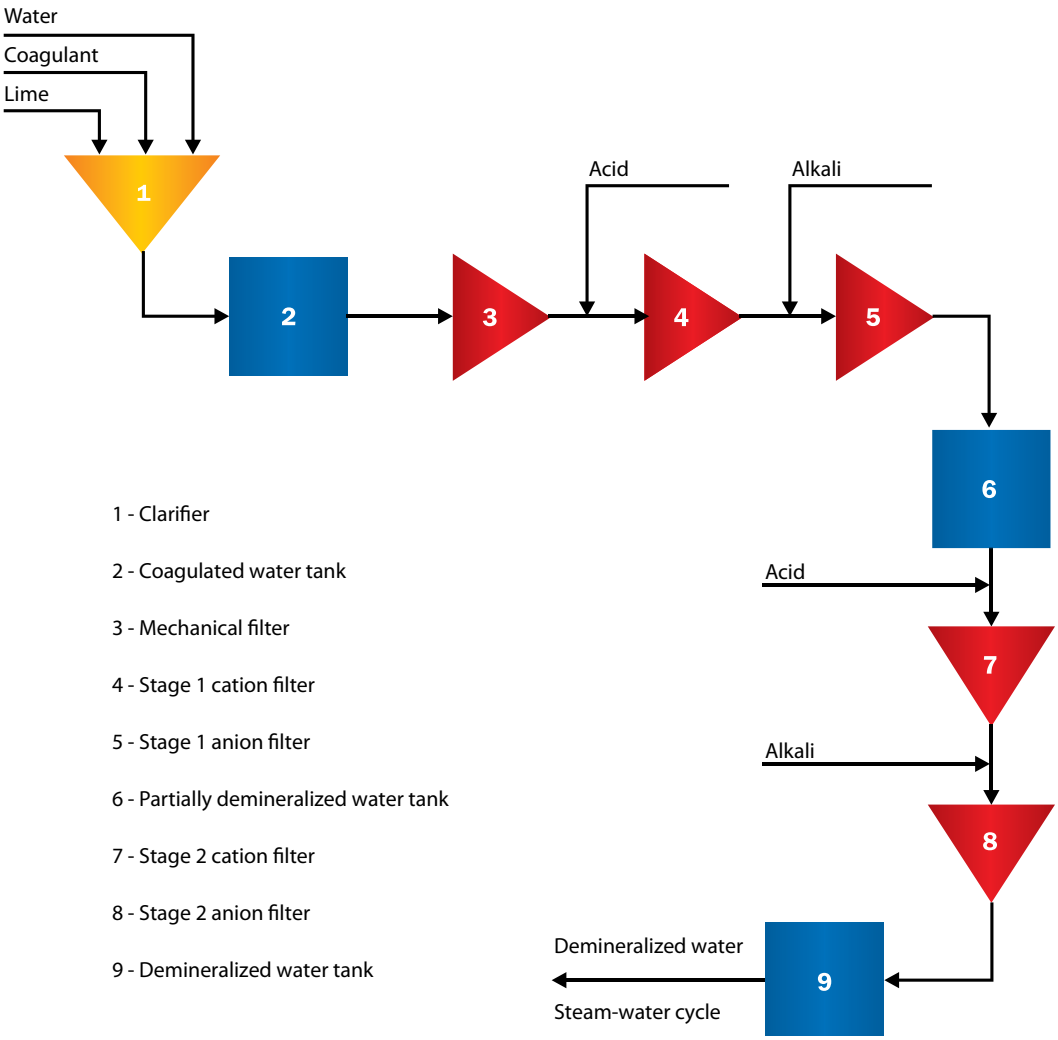
The CHP Plant's Chemical Water Treatment treats water to replenish delivery water in cogeneration systems of industrial enterprises and the city of Ryazan, compensate for condensate losses at enterprises and in the plant's cycle, and polish condensate returned from enterprises. Source water for Chemical Water Treatment (CWT) comes from the Oka River. A microprocessor-based automated parameter control system was installed at Chemical Water Treatment Plants #1.

Control board of Chemistry Department's shift supervisor (CWT-1)

CWT-2 filters

CWT-1 filters

Preparation of demineralized water



1 - Clarifier

2 - Coagulated water tank

3 - Mechanical filter

4 - Stage 1 cation filter

5 - Stage 1 anion filter

6 - Partially demineralized water tank

7 - Stage 2 cation filter

8 - Stage 2 anion filter

9 - Demineralized water tank

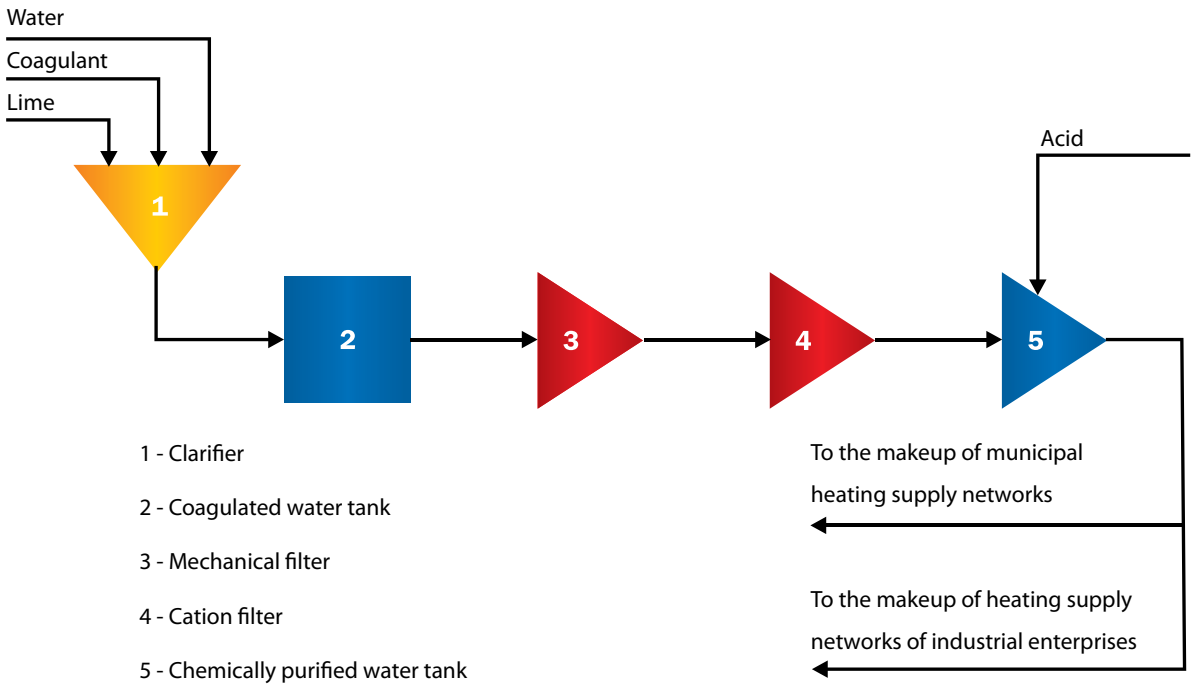
CWT utilises source water processing plants to prepare source water:

1. Demineralized water preparation plant used to replenish condensate losses in the steam-water cycle of energy boilers with a capacity of 600 t/hour, operating under the following process chart: liming and coagulation, mechanical cleaning, two-bed demineralisation using cation and anion exchangers.

2. Chemically treated water preparation plant for the makeup of heating supply networks with a capacity of 1200 t/hour, operating under the following process chart: liming and coagulation, mechanical cleaning, softening via Na-cation exchangers with the addition of weak acidic water to decrease the pH of delivery water.

CWT-1 operating staff

Preparation of chemically treated water



Pump facility of Chemistry Department's CWT-2

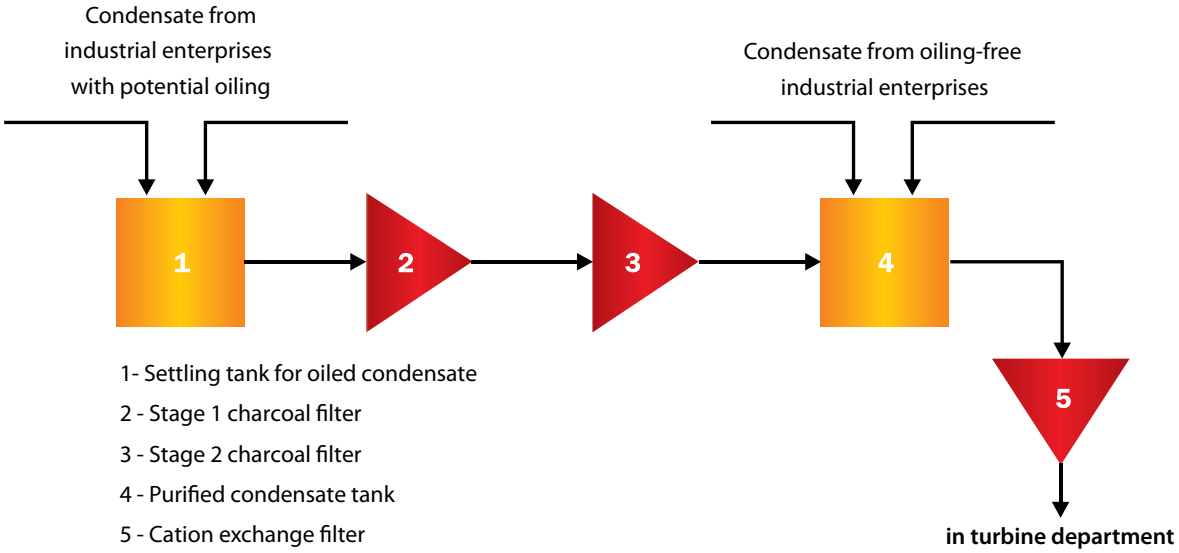
CWT-2 switchboard

3. Plant for the polishing of condensate returned from industrial enterprises with a capacity of 200 t/hour. This plant operates under the following process chart: oil removal in settling tanks, two-bed filtration via charcoal filters, condensate softening via Na-cation exchangers.

Chemical analysis of delivery water in chemical laboratory

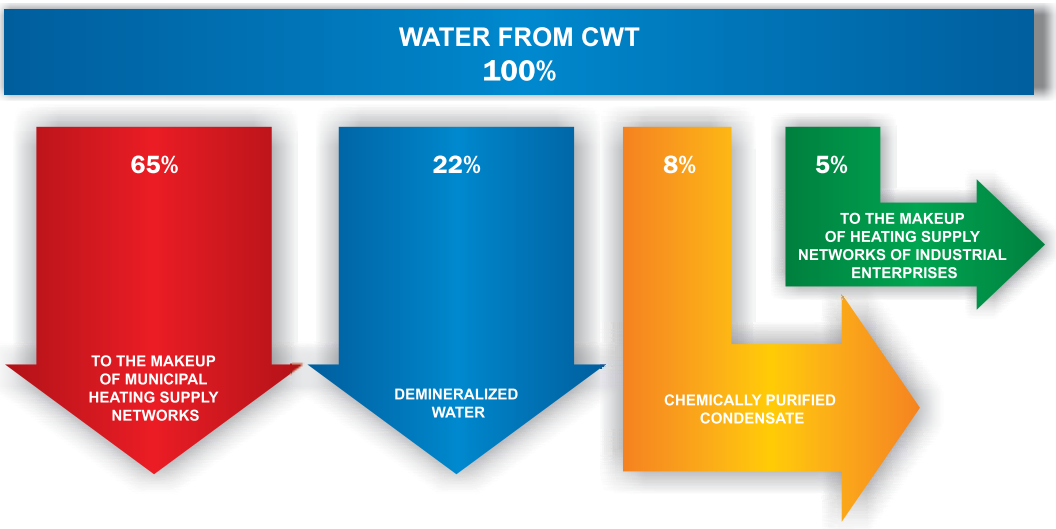
Chemistry Department's chemical-analysis laboratory

Preparation of purified condensate



1- Settling tank for oiled condensate
2 - Stage 1 charcoal filter
3 - Stage 2 charcoal filter
4 - Purified condensate tank
5 - Cation exchange filter

Distribution of CWT prepared water flows



PRODUCTION

Novo-Ryazan CHP Plant produces the following products:

- thermal energy as steam;
- thermal energy as hot water;
- electric power.

Tariffs on the CHP Plant's electric and thermal energy output are approved by the General Office of the Regional Energy Committee of Ryazan Oblast.

Product features:

Steam output: steam pressure – 14.3±0.7kgf/cm^2, steam temperature – 280±14^{0}C.

Hot water (hot water supply and heating):
for municipal heating and hot water supply, straight mains pressure is 14±5% kg/cm^2, return mains pressure is 1.5±0.2 kg/cm^2.

For industrial enterprise heating and hot water supply, straight mains pressure is 9±5% kg/cm^2, return mains pressure is 1.6±0.2 kg/cm^2.

CHP Plant's mains for heating supply of industrial consumers

Hot water is supplied according to the temperature chart for delivery water. The maximum temperature of delivery water in straight mains is 150^{0}C (at ambient air temperature -27^{0}C). In the summer, the straight mains temperature is 70^{0}C.

Electric power is supplied by 0.4 kV, 6 kV, 35 kV and 110 kV power lines according to user categories depending on demand (up to 750 kVA and over 750 kVA).

Power lines from CHP Plant to industrial consumers

MAIN STAGES OF FACILITIES UPGRADES

New power facilities have been commissioned at Novo-Ryazan CHP Plant as part of modernisation investment programs:

Turbine #5

In 1993 at Novo-Ryazan CHP Plant, the worn PT-60-130/13 Turbine #5 was replaced by the new PT 65/75-130/13 Turbine manufactured by Leningrad Metal Plant. The PT 65/75-130/13 turbine has production side streams and heat extractions and a more advanced design layout.

Turbine #3

In 1995 at the CHP Plant, the obsolete and worn VR-25 Turbine #3 was replaced by the new R-25 unit manufactured by Leningrad Metal Plant.

Boiler Unit #11

In April 2001 the new BKZ 420-140 NGM Boiler Unit #11, with a capacity of 420 t/hour, was put into operation. Construction and installation works were performed at Novo-Ryazan CHP Plant's own expense.

Boiler Unit #11

This is the only high efficiency gas-proof boiler currently installed at the CHP Plant. Installation of the new boiler has given the CHP Plant the displacing capacity necessary for replacement and retrofitting of other power units.

Brine well

Brine pump station with well for NaCl brine supply

In 2002 the brine pump station was commissioned at Novo-Ryazan CHP Plant together with a well for NaCl brine supply. It is designed to extract and deliver brine via pipelines to the Chemistry Department for the regeneration of Na-cation filters used to prepare chemically purified water intended for the makeup of Ryazan's heating supply networks. The well is 1300 metres deep; the capacity of the ETsKm-4-3.15-20 type submersible pump is 4.0 m^3/hour.

Feed deaerator plant

In 2002 the 600 ton/hour capacity deaerator plant was commissioned at Novo-Ryazan CHP Plant. It is designed for deaeration of chemically purified source water supplied for the makeup of Ryazan's heating supply networks. The plant allows for deaeration at the maximum flow of makeup water during start-up operations in municipal heating supply networks in case of their breakdown during autumn and winter.

Battery #3

Battery #3 was put into service in 2002. It is a stationary SK-32 type battery mounted in the main building of the plant and is designed for reliable 220 VDC supply to the control and protection circuits of the CHP Plant's main equipment. The battery's capacity is 1152 amp/hour. The stationary battery is recharged automatically.

Turbine Unit #1

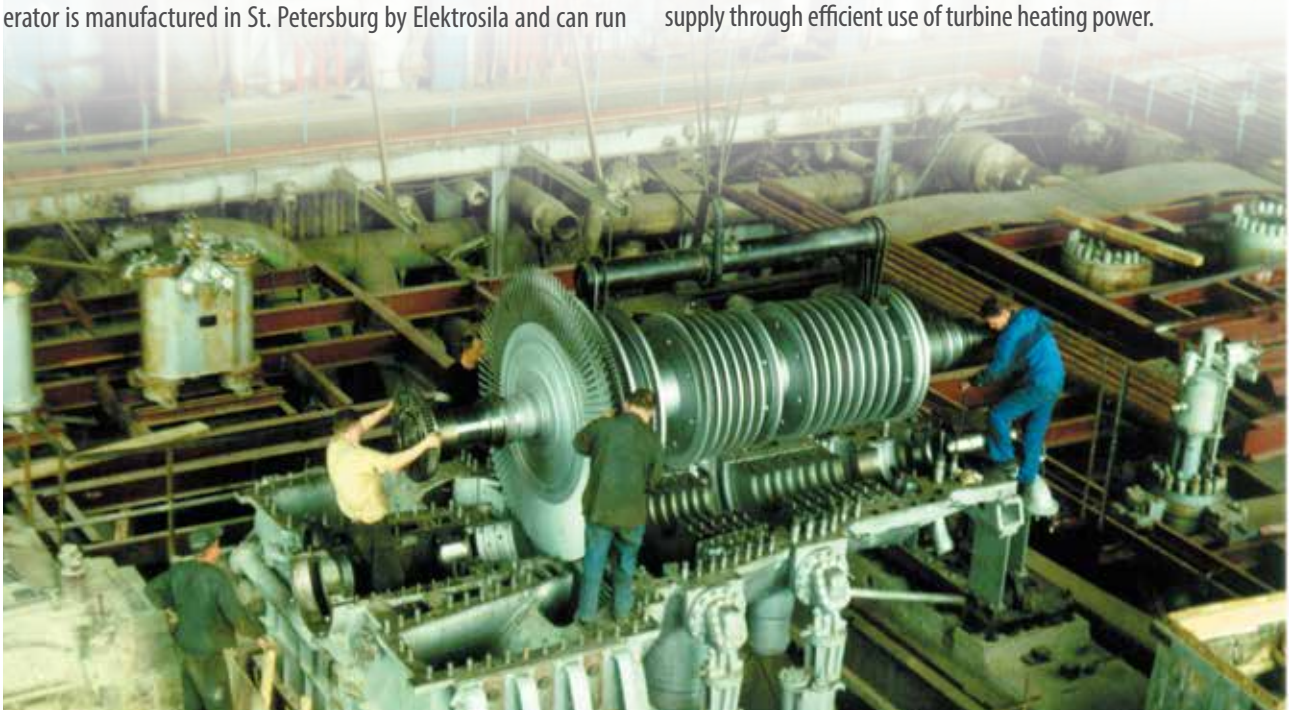
Turbine Unit #1

The new Turbine Unit #1 was commissioned at Novo-Ryazan CHP Plant in June 2002. The 25 MW PT-25/30-8.8 type turbine is made by Kaluga Turbine Works and is designed for 90 kg/cm^2 steam pressure and 500°C. The turbine can run at 30 MW maximum load and has production side streams and heat extractions. The TFP-25 generator is manufactured in St. Petersburg by Elektrosila and can run at 30 MW maximum electric power load. This was the first newly modified turbine generator installed at the CHP Plant featuring air cooling rather than hydrogen cooling. The turbine generator has advanced reliability, explosion safety and fire safety.

Along with the turbine unit, the whole auxiliary equipment system (oil system, pumps, high and low pressure pre-heaters, steam pipelines) has been replaced. Moreover, 6 kV and 0.4 kV switchgears were retrofitted, a new cable system was laid, and the power system protection was replaced with regard for all modern requirements specified for such systems. Along with Turbine Unit #1, a new PCS-based control board for first line units of the CHP Plant was commissioned.

Boiler Plant

In December 2003 a new 200 Gcal/h boiler plant with process control system was commissioned. During construction and installation works, 70 tons of bearing frame, 160 tons of pipelines, and more than 200 shut-off and regulating valves were used. The boiler plant is a set of four high-capacity delivery water pre-heaters, three boiler units, a control system, and pipelines. The plant has a closed-loop process circuit. The heat carrier in pre-heaters is heated by means of turbine supplied steam. Delivery water is pumped into pre-heaters and is heated by steam at 15 atm pressure and 270 °C. The plant's main purpose is improved production efficiency through increased combined heat and power production, as well as improved reliability of Ryazan's heat supply through efficient use of turbine heating power.



Installation of new Turbine Unit #1

Launch of the boiler plant has allowed further plant retrofitting, including commissioning of the new Turbine #6. The plant backs up cogeneration turbines during their maintenance and retrofitting.

Boiler plant

110 kV closed switchgear

In July 2005 the construction of two bays of 110 kV closed switchgear was completed. This switchgear supplies 25 MW of additional electric power to Ryazan Oil Refining Company. The switchgear has unique electrics. Modern 110 kV SF6 circuit breakers are currently used as the main switching devices. Additionally, electric power is supplied to Ryazan Oil Refining Company not by overhead circuits but via arranged 110 kV underground cable lines. Ryazan Oil Refining Company is supplied power by XLPE cable with aluminium core and modern cable terminals. Cables are laid into the closed switchgear using 110 kV feed-through solid insulators, which significantly increases system reliability. The circuit is equipped with 110 kV disconnectors with high-quality polymer material.

SF6 circuit breakers of additional 110 kV closed switchgear bays

Over 14 km of control and power cables are laid throughout the CHP Plant, and cable line protection, automatics, and an alarm are installed. Controls for the 110 kV closed switchgear are located in the Plant's main control room. Microprocessor hardware is used for main protection systems. Supplied power is metered using power meters that allow online reading.

110 kV closed switchgear bays

Cogeneration Turbine #6

In May 2005 the new steam cogeneration T-60/65-130 Turbine #6 with 100 Gcal/h thermal output and 60 MW electric power, manufactured at Ural Turbine Works (Yekaterinburg), was commissioned.

From April 2004 to May 2005, the old T-50-130 turbine was dismantled, followed by the installation and commissioning of the new cogeneration Turbine #6, with increased thermal output and electric power. This turbine is one of three CHP Plant turbines that are able to supply Ryazan with heating.

Installation of new Turbine #6

New Turbine #6

New fuel oil facility's switchboard

As a result of turbine replacement, the installed power capacity of the plant increased by 10 MW while thermal output increased by 8 Gcal/h.

Specialists performed a wide range of installation works, retrofitted electric equipment, and implemented APCS. Turbine #6's mode of operation is controlled remotely from a microprocessor-based switchboard. Turbine replacement improved the reliability and efficiency of Ryazan's heating supply and increased the plant's thermal output and electric power.

New fuel oil facility

In October 2008 a new fuel oil facility was put into operation. It is a complex state-of-the-art equipment system consisting of a fuel oil warehouse with three 30,000 m^3 tanks, fuel oil pump station, fuel oil pre-heating units, fuel oil collection vessel, condensate tank, oil contaminated drainage tank, oil trap, grit dewatering bays, foam extinguisher pump station, control units and utility networks.

Productivity of the new fuel oil facility's equipment (fuel oil flow when supplying CHP Plant boilers) increased 1.4 times compared to the old facility's figures. A new, sophisticated microprocessor-based ACS for the fuel oil facility was implemented. Control of fuel oil intake, storage and feeding to the plant's boiler units is fully automated. Also, automatic record keeping of fuel oil intake and flow is provided.

The sophisticated automated fire suppression system is a fundamentally new implementation. The fuel oil facility is equipped

New fuel oil facility

New fuel oil facility's pumps

with means that provide environmental protection from fuel oil leakages and provide wastewater cleaning from fuel oil elements. The facility improved the reliability of the heating supply system and Ryazan's energy security level.

Accumulator Tank #1

In July 2011 the new Accumulator Tank #1 was commissioned at Novo-Ryazan CHP Plant. It is used for standby storage of chemically purified water used to quickly increase makeup in case of contingencies (damages) to Ryazan heating mains and networks.

New Accumulator Tank #1 has improved design and anti-corrosion features

The capacity of the new tank is 2000 m^3. This unit makes it possible to minimise the risks of emergency shutdown of the hot water and heating supply to consumers and improves the energy security of Ryazan's heating supply network.

Power Transformer #5T

Power Transformer #5T was commissioned at Novo-Ryazan CHP Plant in November 2011. Ryazan Regional Dispatch Office (a branch of System Operator-Central Dispatch Office of the Unified Energy System OJSC) registered connection of the new TDTsTN-80000/110-U1 Transformer #5T to the energy system on November 16, 2011.

New Power Transformer #5T

The block's electric equipment was retrofitted with the most advanced technical solutions and devices. High-voltage XLPE cable line and SF6 and vacuum HV circuit breakers were installed. Block equipment is reliably protected by microprocessor-based power system protection.

This new transformer has significantly increased the reliability of power supply for auxiliaries, Ryazan consumers, and large enterprises of the South Industrial Hub, i.e. Ryazan Oil Refining CJSC (Rosneft Oil Company), Guardian Steklo Ryazan LLC, and other industrial consumers. The 80 MVA transformer was the largest power supply facility commissioned in Ryazan Oblast in 2011.

Delivery Water Pre-Heating Plant

A new delivery water boiler pre-heating plant (DWPP) for the city of Ryazan was commissioned in September 2012. The plant is controlled by sophisticated APCS with automated maintenance of the municipal heating supply regime. The DWPP has provided an additional highly efficient heating supply source to Ryazan with 150 Gcal/h output, i.e. 25% of total hour heating supply to regional center consumers. Launch of the plant became the next step in the implementation of the CHP Plant's modernisation program. Along

Delivery water pre-heating plant

New delivery water pre-heating plant for Ryazan heating supply

with the new boiler unit, one more cogeneration turbine unit was connected to the CHP Plant's power supply circuit. This provided an additional reserve of thermal power and reliability.

Boiler Unit #6

Retrofitting of Boiler Unit #6 was completed in January 2014. A full upgrade of the boiler's gas facility, including replacement of 18 obsolete burners with 6 new double-flow oil/gas burners, has improved reliability and cost effectiveness. Setting and optimising the boiler unit's operation modes improved both the economic and environmental performance of the boiler unit. Specific NOx emissions into the atmosphere have been reduced by 10%. The boiler unit meets the strictest requirements of industrial safety and environmental standards.

During retrofitting, an automated control system for the boiler unit's gas facility was implemented, a new gas-air pipeline network was installed, and a significant portion of the power equipment, e.g. heat exchangers and furnace walls, was overhauled.

New double flow gas burners on Boiler Unit #6 after upgrading its gas facility

SOCIAL POLICY AND CHARITY

Every year Novo-Ryazan CHP Plant allocates funds for the implementation of social development plans. The company has a primary trade union cell representing employee interests. Social partnership involves the signing of a collective agreement containing the most vital aspects of social protection of company employees.

The CHP Plant has a 5-day work week with two days off. For areas where a 5-day work week cannot be arranged, shift schedules that ensure uninterrupted operation are used. According to law, all company employees receive annual paid vacation and paid time off. For certain positions and categories of employees, reduced work hours have been established and additional vacation days are provided.

The company regularly (twice per month) pays wages to personnel, including a monthly bonus based on business profits. Moreover, there are incentives in the form of one-time bonuses, paid holidays, extra pay for hazardous working conditions, special working conditions, night time work, holiday and weekend work, and for holding more than one position.

The collective agreement stipulates certain social protections provided for employees, which exceed the requirements established by law. Company employees can rely on financial aid from the employer upon one's first marriage, childbirth, turning 50 years old, for burial of close relatives, and in case of personal financial trouble. Novo-Ryazan CHP Plant provides vouchers for summer camps for children of all employees. Every year employees' children (up to age 14, inclusive) receive New Year presents.

The plant provides employees with compulsory medical and social insurance as well as preliminary and preventive medical examinations at the company's expense. The CHP Plant regularly diverts money from payroll into the medical insurance fund in order to provide medical services to all employees at their place of residence. There is an on-site first-aid room with medical equipment, which operates 24 hours a day.

The Combined Heat and Power Plant supports ex-employees: pensioners who are World War II veterans or homefront workers. For Victory Day, they receive financial assistance, holiday greetings, and gifts. All plant employees receive bonuses for their professional holiday – Power Engineers' Day. Every year the company pays for all female plant employees to receive gifts for International Women's Day.

The CHP Plant annually allocates funds to establish the best working conditions and to provide work clothes and shoes, required equipment, and tools. The plant also provides monetary compensation to purchase special food (milk) and household cleaners.

Due to the CHP Plant's remoteness from the city, the company provides special, regularly upgraded service buses to transport employees free of charge (to work and back to Ryazan). Buses transport employees after work via several routes to all residential areas of the regional center.

At CHP Plant's trade union committee meeting

Victory Day greetings to WWII veteran, veteran worker of Turbine Department I.V. Shtykov

In CHP Plant's cafeteria

Free employee meal system

Since 2010 company profits have been used to finance a meal system. This system provides free meals in the CHP Plant's cafeteria for all employees. The cafeteria was furnished with new equipment – oven ranges, walk-in coolers, mixers, dishwashers, computers, new cookware, furniture – and was redecorated. New, comfortable dining rooms have opened. The cafeteria's number of seats has tripled – up to 140 seats – and kitchen staff has doubled.

The new meal system allows personnel working throughout the day and night to receive a hot meal (boxed meal) at the start of shift at 7:00 am or 7:00 pm, on weekdays and weekends. The CHP Plant's cafeteria uses computers to register meal distribution. Right now employees use their ID on a special electronic reader to register themselves and immediately take their meal away. It's fast and convenient. The management of the regional organisation Elektroprofsoyuz highly praised these social innovations. Introduction of the free meal program at Novo-Ryazan CHP Plant is a unique practice in the region among Ryazan power companies.

Staff training

Novo-Ryazan CHP Plant is interested in the continuous growth of employees' qualifications and deepening of their professional knowledge. The company has organised a personnel training, retraining and development system in educational institutions of various levels. The plant has its own technical library.

The CHP Plant cooperates with Ivanovo State Power Engineering

CHP Plant's employees are transported to work and back on comfortable buses

University (ISPU) to recruit young specialists. Graduates from this university are invited to work at the plant. Individual orientation programs are specially designed for them, and they receive extra benefits and guarantees. A number of young employees of the company are currently receiving special training at various higher education institutions, including ISPU. Moreover, the CHP Plant pays to educate the best employees.

Sports life

Throughout the year, teams formed by structural departments take part in various sporting events. Company employees and their families can visit the swimming pool and ice skating rink at the Olympiysky Sports Palace free of charge. Every year a big sports festival for employees and their families is held. Following the festival's results, a team is chosen to participate in a Spartakiad for employees of the regional center. Novo-Ryazan CHP Plant's football team competes successfully in various events in Ryazan, and the veteran team has won or placed in many football tournaments.

The CHP Plant's sports history can boast of great achievements. In April 2008 Chairman of the Board of Directors of Novo-Ryazan CHP Plant LLC, Anatoly Shestakov, took part in the first Ryazan expedition to the North Pole, dedicated to the 230th anniversary of the establishment of Ryazan Guberniya, 200th anniversary of the birth of Lavrentiy Zagoskin, a noted Alaska explorer from Ryazan, and 100th anniversary of tennis in Russia. The expedition was led by Mikhail Malakhov, Hero of Russia, Honorary Citizen of Ryazan, Honorary Polar Explorer, and Honoured Master of Sport of Russia. The expedition also included Ryazan natives Mikhail Malakhov Jr., Oleg Naumov, Lev Safonov, and Alexander Shlebayev.

On April 17, 2008, the first Ryazan Arctic expedition reached the North Pole and planted the flags of Ryazan Oblast, the Russian Tennis Federation, and Novo-Ryazan CHP Plant. For the first time in history, the North Pole hosted a tennis match. After completing the expedition, its participants organised the Expeditsiya charity event, during which they raised money for the Ryazan branch of the Rus-

On April 17, 2008, Novo-Ryazan CHP Plant 's flag was planted in the North Pole. Left to right: A. Shlebayev, O. Naumov, A. Shestakov, L. Safonov, M. Malakhov, M. Malakhov Jr.

CHP Plant team's awards for victories at city and regional sporting events

Novo-Ryazan CHP Plant's football team is aimed only at victory

Competition on timed assembly and disassembly of valves at CHP Plant's Spartakiad

sian Children Fund. The fund directed all contributions toward the treatment of seriously ill children.

Technicians from the Thermal and Mechanical Equipment Repair Shop of Novo-Ryazan CHP Plant, twin brothers Alexey and Vladimir Reshetov, are Masters of Sport and repeat participants and winners of national, regional, and city powerlifting tournaments. At the European Powerlifting Championship in 2012, Vladimir earned a bronze medal in the under 90 kg weight division, while Alexey was only a step away from the podium in his 100 kg category, taking fourth place. Both brothers are top-ranked specialists/technicians. They have 6th level skills and have worked at the plant for over 10 years. Novo-Ryazan CHP Plant always supports its athlete brothers.

Brothers Alexey and Vladimir Reshetov – competitors in the 2012 European Powerlifting Championship. On the right: Vladimir is an International Master of Sport, championship bronze medalist.

Novo-Ryazan CHP Plant's team – multiple prize winner at Spartakiad for Ryazan employees

Charity

The management of Novo-Ryazan CHP Plants supports the principals of social responsibility and every year allocates funds for charity. The CHP Plant supports Ryazan maternity hospitals, sports clubs, schools, hospitals, and churches. In particular, it gave neonatal monitors for newborns to Ryazan maternity hospitals. The company purchased new children's beds for the nephrology unit of Ryazan Regional Children's Hospital. The plant donated a set of football balls and basketballs to all Ryazan schools. Novo-Ryazan CHP Plant allocated funds for the purchase of school supplies for first graders in various city schools in Ryazan Oblast. The plant allocated funds to organise excursions for disadvantaged children from Ryazan to MAKS International Aviation and Space Show in Zhukovsky, and also provided funds to organise charity excursions for children from Ryazan Oblast boarding schools. The CHP Plant provided financial assistance to children of officers of the 137th Guards Parachute Regiment and SOBR special police of Ryazan Oblast, who were killed in the line of duty in hot spots, in the amount of the workers' salaries until children reached the legal age of adulthood. The plant was recognised in a letter from the governor for its participation in the regional charity marathon "To Children With Love". Novo-Ryazan CHP Plant is a permanent sponsor of the regional creativity competition of journalists, Crystal Crane.

Among socially important charity projects in Ryazan is the construction of tennis courts in Gorroshcha Park, which was financed by Chairman of the Board of Directors of Novo-Ryazan CHP Plant, Anatoly Shestakov. The plant supported distinguished Ryazan athletes: multiple World and European Champion in rowing Nikolay Lipkin, multiple World and European Champion in rhythmic gymnastics Tatyana Sergeyeva. The CHP Plant's contribution toward the training of Ivan Nifontov, World and European Champion in judo and London Olympic medalist, was acknowledged as particularly notable. Since 2010 the CHP Plant has made monthly donations to the Ryazan Oblast Social Development Fund to support the training of a talented athlete. In 2013 Anatoly Shestakov was awarded the badge of honor of the Russian Olympic Committee "For merit in the development of the Olympic movement in Russia" for supporting the Olympic training program of judo competitor Ivan Nifontov.

Ivan Nifontov, World and European Champion in judo, London Olympic medalist, during his meeting with CHP Plant workers

By decision of the regional government, Chairman of the Board of Directors of Novo-Ryazan CHP Plant LLC, Anatoly Shestakov, was awarded the commemorative medal of Ryazan Oblast "Patron and benefactor" for continued support of patronage and charity traditions.

Novo-Ryazan CHP Plant is a sponsor of All Russian Junior Tennis Tournament for the Radvest Tennis Club Cup, Ryazan

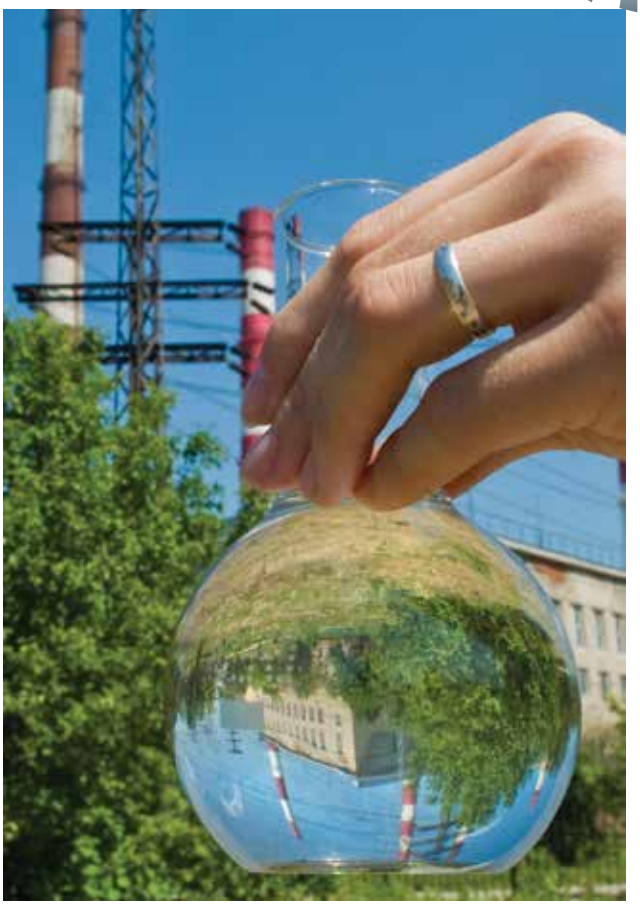
ENVIRONMENTAL PROTECTION

Environmental management system Novo-Ryazan CHP Plant complies with the international standard ISO 14001

In 2009-2010 large-scale work was performed to implement an environmental management system (EMS) at the CHP Plant. During preparations for certification of the CHP Plant's environmental service, all internal standards were developed. Novo-Ryazan CHP Plant's environmental management system successfully passed all necessary tests, and in 2013 the certificate of ISO 14001:2004 compliance was granted, which expires in 2016. Russian Register Certification Association (St. Petersburg) was chosen as the certifying organisation. Russian Register is a member of IQNet (International Certification Network) and has international accreditation recognised by the International Accreditation Forum.

The plant's own certified laboratory and other accredited organisations monitor environmental conditions online. All indicators characterizing Novo-Ryazan CHP Plant's environmental impact fall within the limits of established norms.

As a result of implementing environmental measures in 2010-2013 and switching to natural gas, atmospheric emissions of nitrogen dioxide were reduced by 34% and nitrogen oxide by 36%. Carbon monoxide emissions were reduced to 40% of 2009 levels. Boiler Unit #6 retrofitting alone allowed for the intensity of nitrogen oxide emissions to be reduced by 10%. Additionally, the total emission volumes of all types of pollutants was 30% of established norms.



Measures taken in 2010-2013 to reduce the volume of wastewater discharge made it possible to reduce total effluent discharges from all four outlets by 35% compared to 2009 levels. The maximum reduction of effluent volumes – by 63% of 2009 levels – was ob-


СИСТЕМА СЕРТИФИКАЦИИ РУССКОГО РЕГИСТРА

СЕРТИФИКАТ

СООТВЕТСТВИЯ СИСТЕМЫ МЕНЕДЖМЕНТА

Рязанского филиала ООО "Ново-Рязанская ТЭЦ"

ИСО 14001:2004


IQNet

THE INTERNATIONAL CERTIFICATION NETWORK

CERTIFICATE

Ryazan branch of the LLC "Novo-Ryazanskaya HPP"

Legal address: 14, Universitetskaya Str., 420111, Kazan, Republic of Tatarstan, Russia

Actual address: 23, Yuzgrey industrial junction, 390011, Ryazan, Russia

production, distribution of electric and thermal energy

Management System

ISO 14001:2004

Registration Number : RU-13.0625.026

Certificates of conformity of Novo-Ryazan CHP Plant's environmental management system to international standard ISO 14001

tained on Outlet #2. The discharge volume for this outlet was 20% of established norms. The total discharge volume from all four outlets of the CHP Plant in 2013 was 25% of established norms.

During implementation of the environmental policy, great efforts were made to reduce the concentration of the main polluting components in wastewater. As a result of this work, the concentration of suspended solids in wastewater was reduced by 15%, chlorides by 18%, sulphates by 16% and iron by 15% compared to 2009 levels. Moreover, according to regulatory documents, Novo-Ryazan CHP Plant does not add additional pollutants into wastewater during the production process. The composition of the CHP Plant's effluent is identical to or even better in terms of quality than the composition of source water from the Oka River brought in for production needs.

Crushing machine for wood waste disposal

Soil conservation measures included organisation at the CHP Plant of special sites and vessels for temporary storage of solid process waste, ensuring their separate collection. For safe disposal of wood waste, the company purchased a crushing station in 2014 to turn wood waste into wood fines. This method of wood waste disposal is the most eco-friendly, as it prevents the accumulation of large volumes of flammable materials in municipal landfills.

As part of modernisation of the monitoring system, stationary gas analysers, smoke meters, and other measuring instruments on the CHP Plant's main power equipment are regularly tested and upgraded. There is continued outfitting of the CHP Plant's chemical laboratory with sophisticated analytical control instruments. Wastewater volume metering at Novo-Ryazan CHP Plant is automated: all 4 outlets are equipped with flow meters. These measures have allowed the control over production processes and environmental impact indicators to be improved.

In 2013 Novo-Ryazan CHP Plant was named winner of the All Russian competition and received a gold medal for "100 Best Companies in Russia. Environment and Environmental Management" at the VII All Russian conference "Ecology and Production. Development Prospects for Economic Mechanisms of Environmental Control", which took place in St. Petersburg. The award, established by the Russian Environmental Association, was given to the plant on the recommendation of the Ministry of Nature Management and Ecology of Ryazan Oblast for great results in environmental protection and effective environmental management corresponding to the international standard ISO 14001.

CONTACTS AND LOCATION MAP

RECEPTION OFFICE:
(4912) 24-13-61, (4912) 24-13-62
534@tec.ryazan.ru

ADMINISTRATIVE OFFICE:
tel./fax (4912) 24-03-10

ASSISTANT DIRECTOR FOR PUBLIC RELATIONS:
(4912) 95-99-36
i436@tec.ryazan.ru

PRODUCTION AND TECHNICAL DEPARTMENT, SALES AND COMMERCIAL ACCOUNTING GROUP:
(4912) 95-99-77, fax (4912) 95-99-08
365@tec.ryazan.ru, 277@tec.ryazan.ru

HR DEPARTMENT:
(4912) 90-58-70, 95-99-45
338@tec.ryazan.ru

PROCUREMENT AND LOGISTICS DEPARTMENT:
(4912) 95-99-63, fax (4912) 95-99-09
560@tec.ryazan.ru

Full company name: NOVO-RYAZAN CHP PLANT LLC
Full name of the company branch:
Ryazan branch of NOVO-RYAZAN CHP PLANT LLC

Legal/postal address of the branch:
Yuzhny promuzel 23, Ryazan, 390011
www.nrtec.ru, twitter.com/nr_tec, www.facebook.com/nrtec

Light and heat to every home!

Translation into English - Janus LS LLC, Moscow