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The development of power engineering in Belarus on the example of Beryozovskaya Power Station

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Belarusian power engineering originates from 1920s, when small power stations used to produce electricity in order to illuminate streets. However, the purpose of my report is to describe the development of the whole power system of our country, so I have chosen Beryozovskaya power station as an example. Its construction began in a distant 1960, but today it is the third most powerful in Belarus [1].

Let's turn to the history of the object under consideration. By the mid-1950s, USSR top leadership in the energy sector had started to think about a new scheme of electric power production. Instead of a big number of small power stations, they planned to build energy giants able to provision the whole region with electric power. The Council of Ministers of the USSR made a decision to construct the power station on the February 9, 1956. The place for the construction was chosen in the southern part of BSSR (Belorussian Soviet Socialist Republic), because there was an urgent need for large amounts of electric power in this region, just like in the whole republic. This date may be considered as one of the most significant in the history of Belarusian power engineering, because it was then that our country – a midget dependent on other republics in terms of energy supply – turned into the energy giant.

Such a loud statement can be supported by crude facts: even after 50 years since its launching Beryozovskaya power station produces more energy than thermal power plants TPP-

1, TPP-2 and TPP-3 put together. It is exceeded only by Novolukomlskaya power station and TPP-4 [2].

As it has already been mentioned, the power station was designed to operate on peat, like all USSR power stations of those times. In order to provide a constant supply of raw material a railway was laid. It extended from the railway station of Beryoza up to one-kilometre long conveyor belt situated on the territory of the power station. Nowadays all that's left from the conveyor belt is a 25-metre high hill and rumour has it that the director of the power station pushes those who misbehaved and didn't work over the year down the hill in winter. What concerns the railway, it's still functioning and is used to transport chemicals and bulky parts to the power station.

The construction that started on the shore of the lake Belye can be called grandiose. Young communists from all over the Soviet Union gathered to help build the station. The settlement where builders and future workers lived was growing along with the power station. With time, it turned into the town of Beloozyorsk. Even today most of its population works on the power station and accompanying enterprises.

Nevertheless, Beryozovskaya power station wasn't meant to operate on peat. By the time the 1st power generating unit was installed and the installation of the 2nd one began, all the world's largest power stations had started to use fuel oil, which was much more profitable. So, the officials of the power station promptly decided to change the direction of their work to keep up with others. In the shortest possible time 5 fuel oil storage tanks were built and the amount of fuel oil in stock was enough for the station to generate power continuously for a month. Besides, power lines that were connected to Beryozovskaya power station were built across the republic to supply the country with electric power in case of breakdowns at other power stations.

So, on the December 29, 1961, the turbine №1 was launched, Beryozovskaya power station produced the first current, and Belarus entered a new energetic era.

The following 30 years were relatively peaceful and everyone seemed to have forgotten about Beryozovskaya power station. It produced power regardless of the political situation in the country and weather conditions outside.

In 1997, Beryozovskaya power station drew the attention of Polish Ministry of Energy. And after brief negotiations the works on constructing a 330-kilovolt substation (which are quite rare in Belarus even nowadays) began in December of the same year. What is more, a separate power line towards our neighbours and additional power lines towards Baranovichi, Brest and Ross were built. By January, 2001, the first Belarusian current had been transferred to Poland [3].

However, equipment can't work forever, it has its expected life. In 2001, right after the construction of a new line, Belarusian Ministry of Energy commanded to switch to another type of fuel – natural gas. And this meant the beginning of a new, fuel oil free epoch.

Nevertheless, time goes by and technical progress is inevitable. So, when the Chinese colleagues phoned the officials of Beryozovskaya power station and offered to build a modern power generating unit that would surpass any other power unit in Belarus, the director of the power station accepted the offer.

The Chinese delegation came to Beloozyorsk with the business offer in 2011. Of course, they were met with suspicion, as their project was amazing and alerting in the same time. I'd like to cite some figures: the capacity of the 3rd and the 4th power generating units was 160 megawatts, the capacity of the 5th one after reconstruction was 220 megawatts, the capacity of the 6th power unit was 180 megawatts. The Chinese project suggested that the capacity of a new 7th power

generating unit wouldn't be less than 480 megawatts, i.e. it would be able to replace 3 old power units. The secret was to use unique combined-cycle gas turbine units [4].

The project was approved and the construction began. As I have already said, there weren't any power generating units like this in Belarus at the time. In 2013 the 7th power unit was connected to the common system and generated current for the first time. The modernization of the 5th power generating unit had been completed by that time, and the rated capacity of the power station was already 1,200 megawatts, which is a tremendous result for such an old power station.

To sum it all up, Belarusian power engineering walked a long and thorny path, and so did (and still does) Beryozovskaya power station. It all started with power stations operating on peat and wood. Then the period of fuel oil began, which was followed by natural gas usage. Finally, after the period of natural gas the era of modern combined-cycle gas turbine units commenced. It seems to me that they will be in the lead in terms of quality and quantity of the electric power produced for a long period of time [5].

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