

Serbia: EPS power utility, good power generation despite poor hydrology

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Balanced electricity generation is one of the cornerstones of Electric Power Industry of Serbia's generation and business operations and Serbia's power system stability. While a dry year like 2019 may favour coal mining, it is certainly not ideal for generating electricity in the hydro sector. However, in 2019, the HPP Djerdap branch managed to achieve good generation results and plans, despite the fight against poor hydrology. Out of the 12 months, only May and June have been at the boundary of the multiyear inflow average on the Danube. All other months have failed. October was most disappointing, with average inflows of 2,384 cubic meters.

HPP Djerdap 1

The generation plan of the first Djerdap power plant has been realized. All overhauls scheduled for this year have been completed and the power plant and all its facilities are absolutely ready for the coming winter. The superstructure on the Danube are not only units, this is a complex structure that has been filling for almost half a century. Experts take steps every day to make everything operate as it should. As far as the riparian area protection is concerned, all facilities are fully operational and ready for winter conditions. In the last two months of 2019, the focus was on the commissioning of a revitalized unit of the second largest Serbian hydroelectric power plant. It operates under the normal operation mode, as other units. The only difference is that it is under increased supervision, because it is within a warranty period of two years, during which the equipment contractor and supplier, the company Silovie Masini from St. Petersburg, are responsible for any operating defects.

- So far everything has been working according to plans and we regularly take all necessary measures to keep it that way. The first check will follow after 2,000 operating hours, which is expected in March. If the flow of the Danube is favourable, stopping can be delayed - Radomir Mitrovic, director of HPP Djerdap 1, reports.

Activities are underway to supply equipment for the last revitalization phase that will "rejuvenate" and modernize Unit 3, as well as equipment works. Wicket gates are repaired at the Kolubara Metal plant in Vreoci. Parts of the stator of the main generator have arrived to the power plant. It is envisaged that part of the stator assembly work will be carried out at

the assembly area and then transferred to the generator pit, where the rod winding and other finishing work will be take place.

Delivery of the turbine parts is planned for April, the shaft and the runner will arrive to the power plant in July 2020. The emphasis is on completing as many works as possible in the preparatory period in order to have more workers available for the main works. It is likely that the last revitalization phase will begin on 1 September 2020.

HPP Djerdap 2

With such poor hydrology, the power plant 80 kilometres downstream had better results statistically. On 10 December, HPP Djerdap 2 fulfilled its obligations from the 2019 generation plan. It sounds illogical, but with the same water, Djerdap 2 only had problems for four months (June, July, August and October). This shortage was offset in other months, where generation went up to 27.3 percent over the plan. The characteristic of the second power plant is that in the dry season water level gets lower, however, this increases the head, resulting in more generation. During the year, there were no failures that would jeopardize operational readiness of the units and hence the generation plan. Maintenance efficiency indicators have been met, exceptional unit availability has been achieved. All the planned overhauls have been completed and this facility is absolutely ready for the winter. The units of the primary power plant have been in operation for more than 30 years, which by the current standards is their lifetime. The units of the additional power plant, which are slightly younger, will have also been more than 30 years in operation by the time of their upgrades.

Expert team in charge of revitalizing HPP Djerdap 2 submitted the final version of the Terms of Reference for revitalization works.

HPP Pirot

Hydrology has also failed on Stara Planina. The generation plan of HPP Pirot is 55 million kWh, which is half its annual average generation. There are currently 66 million cubic meters of water in the Zavoj reservoir, or about a third of the reservoir. Expressed in energy, this is 35 million kWh.

All planned overhauls for 2019 have been completed and there have also been some unplanned ones. Thus, due to the identified defects on the intermediate pole connections of the rotor, it had to be removed for repair. During the overhaul, major efforts were made to test the power equipment and intake structures in order to better prepare the power plant for the coming year, when a major three-month overhaul is planned. The power plant is ready to react and cover power system needs in just a few minutes.

Vlasina HPPs

Vlasina hydropower plants, although entering their 65th year of operation, have achieved generation plans. The total shutdown of the power plants due to regular overhaul lasted 30 calendar days. Due to their age and equipment wear, there were also some non-standard interventions. The list of works is long, however, the repair of the warm points of the generator stator sheet package, together with the repair of the stator hemispheres need to be singled out. On HPP Vrla 1, generator and transformer bays have been upgraded. All four unit transformers were replaced. At the G2 generator of HPP Vrla 2, stator rewinding was also performed. Much work is being done here to keep the system on a very high efficiency level. In 2018, the tender documentation for the procurement and installation of electrical equipment for the reconstruction of Vlasina HPPs was prepared by the consulting company STUCKY Balkans. To prepare for the forthcoming revitalization of the units, cranes of all power plants need to be upgraded.

Readiness and plans

HPP Djerdap branch generation capacities are in maximum operational readiness. Plans for next year are ambitious. The revitalization of the HPP Djerdap 1 ship lock is expected to start soon. In addition to the usual overhauls, preparation for the revitalization of primary equipment will continue on HPP Djerdap 2 and Vlasina HPPs, while in HPP Pirot, intake structures and the switchgear will be overhauled. Different experts of this branch are on the top of their game, which is essential to maintain the maximum operational readiness of generation capacities. The only unknown thing is what the nature will bring.