The entire work finished in short-term
Works performed on facilities constantly in operation

Overhaul work during this season at the TENT branch was standard on all of its plants. Nonetheless, on some units, the volume of work performed still exceeded the standard one. At one point during the overhaul season, three units of this thermal power plant were shut down.
In early September, planned downtimes of units 1, 2 and 3 coincided for eight days. During this extremely short period, some very complex interventions were performed on individual power plants. According to Aleksandra Dimitrijevic, lead power facilities engineer at TENT A, 6 kV switchgear of the general group 3 GA and 3 GB was replaced during the simultaneous downtime of the above units by a retractable state-of-the-art medium-voltage plant.
– As part of the planned works, a complete 6 kV 5G switchgear was replaced, and at the same time the control system of the slurry station, which is common for units 1, 2 and 3, was replaced. In parallel with the replacement of the 6 kV plant, upgrade of low-voltage plants was carried out at the slurry station, together with low-voltage installations at the coal unloading station 1, also shared by the three units. All the cables on the so-called T5 trolleys, in the main power building bunker tract, at a 42-meter elevation, part of the coal delivery unit 1 were replaced. They are used to transport coal to the bunker for appropriate units by a belt conveyor system from the inclined bridges – Dimitrijevic said.

Live work

– It is far easier to replace devices and equipment on one of the units, because it can be done independently, during a downtime or an overhaul of an individual unit – Perica Dejanovic, engineer in charge of external TENT A facilities management, added. – When such works are performed on a shared plant, such as a slurry station serving three units, then careful preparation is essential. It is extremely difficult to perform any interventions on shared facilities, let alone make any kind of upgrades, because they need to be constantly energized, i.e. constantly in operation.
Shared facilities, such as slurry stations of Units 1, 2 and 3, coal supplies 1 and 2, serve multiple units, some of which, such as process water treatment, pumping and fuel oil stations, ash and slag dumps are required to operate all six TENT A units.
The fact that 6 kV switchgears of general groups are necessary for the operation of several units, Aleksandra Dimitrijevic adds, requires a lot of attention, but also detailed preparations to ensure successful completion of all planned operations. This, too, cannot be achieved successfully without teamwork, as several groups of engineers, technicians,

repairmen and workers from the Maintenance and Production Sector are engaged. Although the replacement of any power facility is within the scope of the above sector, the job is common to everyone in the Electrical Maintenance Service, which includes the Control, Signalling and Protection Group, the Measurement and Control Group, as well as the Process Computer and Communications Group.
– We are working together, but also individually, and depend on one another in every sense of the word, both from the aspect of equipment maintenance and the aspect of functionality of technological units. We cannot do one without the other, especially when it comes to these kinds of jobs, which are specific and due to the fact that they are performed on shared facilities, which always have to be energized in operation– Ms. Dimitrijevic said.
Marko Cvijanovic, engineer for transformers and 6 kV motors, was in charge for complete logistics of these operations in addition to the procurement and approval of the documentation for the delivered plant.
– These works also had to be coordinated with EMS. What made things more difficult was that we had to ensure functioning of some shared facilities, to allow units to run smoothly – he says.

Scenario for high-risk situations

Due to the nature of different activities, the works were also associated with high risks which, according to Marko Cvijanovic, had been previously foreseen, analysed and prevented.
– For every possible risk scenario we had a backup variant, we handled things on the go without any tension. We even had back-up power supply, while the weather conditions were also favourable – he says.
Aleksandra Dimitrijevic highlighted that when it comes to risks, two things are vital, both in operation and maintenance. Primarily, people’s safety, followed by plant and equipment security, while ensuring the reliability of units in operation and smooth electricity generation.
– These are the risks we face on a daily basis in the ongoing maintenance of different facilities, especially throughout upgrades like this one, – she said.
Djordje Kokovic also took part in the works, who strengthened TENT’s ranks in August. He emphasized that in a short time he had something new to learn, primarily good business organization and teamwork. Dragan Tomic, 0.4 kV switchgear engineer, Dragan Stankovic, electrical protection engineer, and Bojan Radojicic, lead engineer of the control, signalling and protection group also greatly contributed to the successful implementation of the above activities. However, they were unable take part in this interview. Otherwise, in addition to these non-standard works, standard overhauls were performed, together with the usual

routine maintenance activities.
All interviewees have agreed about one thing. It was difficult to organize all the planned tasks. Nonetheless, with extremely good collaboration with colleagues from the Generation Sector, success was guaranteed. The deadline was, however, too short, and space was tight, as several groups operated at a time in a relatively small area, such as the room of the 6 kV slurry station switchgear. Regardless of this, everything was done successfully and on time.

In operation

A state-of-the-art 6 kV plant consisting of 16 cells was installed in the slurry station of units 1, 2 and 3. The installation of a new control system based on PLC controllers enables monitoring and control of the 6 kV plant and the slurry station.
The 6 kV general group switchgear, which has been completely replaced, is in the main power building, in the bunker tract of units 1 and 2 at zero meters. It comprises 27 cells in a linear sequence, some 27 metres long.
Source: EPS Energija