

Modernization of 2 1MW, 6kV grid water pumps with by-pass systems at a coal-fired thermal power plant with installed electrical power of more than 240 MW and achievable thermal power of more than 800 MW

The purpose of the modernization was to optimize the operation of grid water pumps (one pre-pump and one main pump), thus contributing to the planned savings in thermal power transmission. The PowerFlex 7000 medium-voltage inverters based on the CSI (Current Source Inverter) solution achieve a near-sinusoidal shape of voltage and current at the output. As a result, the additional thermal losses in the motor and the effect on its insulation are insignificant. The temperature rise in a motor powered by an inverter is typically about 3°C compared to a motor supplied directly from the grid. This results in standard design motors being able to operate without restriction with the inverter. This has allowed the use of existing 6kV 1000kW motors from the 1970s and 1980s. Thanks to full four-quadrant operation, the user additionally gained the ability to dynamically decelerate the pump and speed control with energy return to the grid. The entire task was carried out on a turnkey basis, from design documentation, changes to the power supply fields and control system, delivery of two PowerFlex 7000 120A, 6kV inverters along with bypass switchgear, to commissioning and operator training on operation. The economic benefit of controlling two pumps with inverters is a 17% decrease in energy costs.

Scope of work:

- Preparation of project documentation in therm - odernized scope
- Delivery of two PowerFlex 7000 (current type) 120A, 6kV inverters from Rockwell Automation along with bypass switchgear
- Modernization of 6kV power supply bays along with the control system
- Commissioning of the modernized network water pump system
- Delivery of complete documentation in the modernized scope
- Operation and operation training