CASE STUDY

ELHAND Transformatory for the Drives Systems

CLIENT

The Institute of Power Engineering - National Research Institute, Gdańsk Division is a leading research organization specializing in analyzing and implementing innovative solutions in automation for the power sector. It actively operates in the fields of power generation from both conventional and renewable energy sources (RES), as well as in energy storage, transmission, distribution, and efficient utilization. Among its five divisions, the Gdańsk branch stands out as the largest and most prominent field office, playing a key role in executing strategic projects.

CHALLENGE

A sugar refinery, acting as the end investor, required a reliable and modern excitation system for its synchronous generator. The turbine-generator set was to play an important role in reactive power compensation and ensuring emergency power supply in the event of a loss of access to the medium-voltage network.

The greatest challenge was meeting the tight deadline for transformer delivery before the start of the so-called sugar campaign, which runs from autumn to mid-winter. During this time, any failure could interrupt production processes. The excitation system needed to be overload-resistant and ensure stable operation of synchronous machines.

SOLUTION

Elhand provided two advanced transformers for the excitation circuit of the synchronous generator, as part of a modernization effort led by the Institute of Power Engineering, Gdańsk Division.
Elhand's transformers were designed with a focus on:

- **High reliability** – critical for the plant's operation.
- **Optimal operating parameters** – ensuring stability in both static and dynamic states.
- **Resistance to higher harmonics** – present in the circuit, mitigating the risk of overvoltage, overheating, and system instability.

The voltage regulators used in the generators feature excellent regulation characteristics and precise voltage parameter adjustment, enhancing the efficiency and safety of the entire system.

RESULTS

The excitation transformers delivered by Elhand:

- Operate faultlessly within a system equipped with an automatic voltage regulator, adapting voltage to the requirements of power electronics.
- Have been optimized for resistance to current harmonics, preventing issues such as overvoltage and overheating.
- Ensure stability and reliability, which are crucial for maintaining continuous production processes during the sugar campaign.

The outcomes of this collaboration confirm the effectiveness of Elhand's technology in demanding industrial applications.

Photo: Andrzej Seget Junior Key Account Manager Elhand Transformatory.
Product: ET3H with 74kVA and voltages of 6300V//145V