

BASIC ENGINEERING FOR COIL BUILDING FOR TENNET

INSTALLING BLIND CURRENT COMPENSATION COILS IN WESTERLEE, THE NETHERLANDS



The project concerned the installation of blind current compensation coils on the tertiary 50kV side of the transformers in Westerlee, the Netherlands. In view of the surroundings and the associated noise requirements, a coil building was provided in which the three compensation coils will be set up, together with the 50kV Gas Insulated Switchgear (GIS). TenneT commissioned Bilfinger Tebodin to create the Basic Design for this.

Copy or new design?

In terms of civil engineering, the application for the project was based on making a copy of the closed flush building in Wateringen, the Netherlands, but with modified foundations due to the fact that the new building had to be built over an existing 150 kV cable route.

Market Energy & Utilities

Client TenneT TSO B.V.

Location Westerlee 380kV/150kV, the Netherlands

Scope of work

- Basic Engineering
- Acoustic study
- Providing drawings and calculations of primary and high-voltage cables
- Permit drawings

However, a number of preconditions were not taken into account which made an exact copy impossible:

- TenneT's standards had changed over time
- The compensation coils for Westerlee are of a different type (no separate cooling radiators) than those at the Wateringen station
- The architectural design of the coil building at Wateringen station did not fit in with the architectural image of the existing Westerlee station.

This ultimately led to a completely new design for a semi-open building, which also took into account the requirement for IFD construction.

Acoustic Study

As part of the project, Bilfinger Tebodin conducted an acoustics study for the permit application. As the noise situation of TenneT's coil building in the surrounding area is critical, it proved that the acoustic study had a major impact on the building design. The building design was therefore adapted in order to meet noise requirements.

The design was adapted in such a way that the most favorable solution for TenneT was chosen in terms of noise, design and building costs. In order to monitor this process and the feasibility, various meetings were held with the competent authorities to get to a situation that was acceptable all stakeholders.

Innovative solution for limited available space

This project is interesting from a cables and pipelines point of view because of the overpass over the existing (and narrow) 150kV cable route, thermal influence and EMC aspects. Because of this, Bilfinger Tebodin developed various route scenarios and decision tables including crossing with a ditch (HDD drilling).

Due to the limited space available at the station, both the drilling and subsequent looping of the 50kV cables in the new coil building were a challenge.

Many stakeholders were involved in the project and as a result, the architectural design of the building had to be modified several times. In the end, Bilfinger Tebodin was able to produce a Basic Design for the new coil building in Westerlee that fully met TenneT's requirements and expectations.

