

MEDOW Training Event

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BritNed converter station in Kent

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As a MEDOW training event, we visited the HVDC converter station of BritNed in Kent on 10th December. It is an updated one compared to the UK-France HVDC cross-channel converter station at National Grid's Sellindge Substation, we visited in the morning that day, because it was fully operated in the April 2011 but the latter one was in 1986. The electrical devices and technologies are more advanced for the rapid and ongoing development of the electrical power system. Figure 1 shows the schematic diagram of this project.

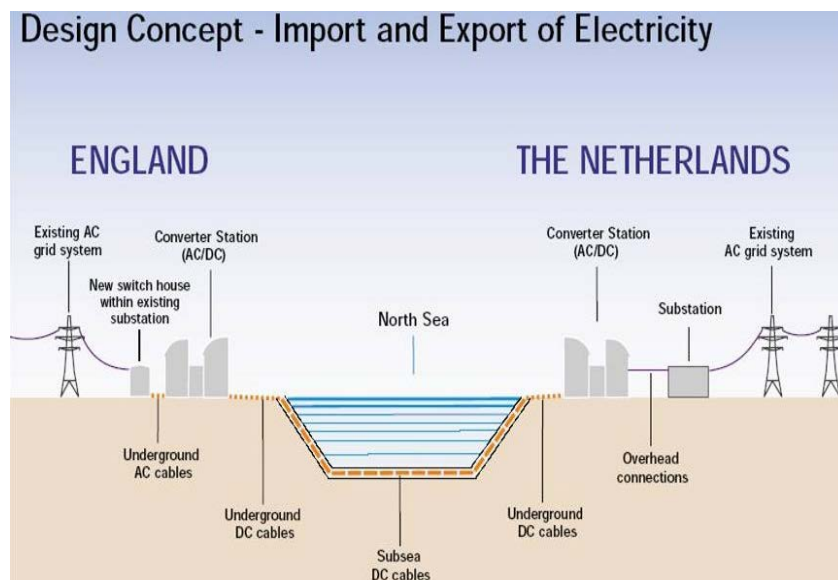


Figure 1 The design concept of the BritNed project [1]

The basic principle of this system is: the AC power from Netherlands will be converted to DC power at the converter station in Maasvlakte, Netherlands, then the DC power will be transmitted through the submarine HVDC cables to the Kent converter station, at last the DC power will be inverted to AC power and transmitted into the Great Britain power grids.

The construction of this subsea interconnector required careful planning and precise execution. BritNed worked with its construction partners as one single team to safely design, manufacture and install the BritNed Interconnector to high standards of civil, marine and electrical engineering.

The construction comprises three major components:

- 1) Manufacturing of the subsea cable and corresponding cable installation;
- 2) Civil construction of two converter stations;

3) Manufacturing and installation of the required electrical equipment and components in the converter stations [1].

During the visiting, the operators there took us around the main equipment, such as the huge Siemens single-phase power transformer, the LCC converters and circuit breakers in the converter halls and filter yard installed in this station. The power flows from the thyristor converters to the DC cables through DC smoothing reactors, which were used to mitigate DC current ripple. Additionally, there were also DC filters used to eliminate unwanted harmonic components on the DC side. Figure 2 shows the devices installed at this converter station.



Figure 2 The equipment at this converter station [1]

This visiting is quite useful for us to deeply understand the HVDC systems, not only on books and technical papers but on physical devices and operational levels. The field experience will be helpful for our future research. It also gave us an insight about the real world materials used for HVDC interconnection, especially the DC hall, filter arrangements and the single phase transformer, models each of which will be used for our research in developing multi terminal DC grid for offshore wind farm network, MEDOW.

Reference:

- [1] BritNed, Construction, [Online]. Available:
<http://www.britned.com/BritNed/About%20Us/Construction> [Accessed: 7-Jan-2013].