SIEMENS

Press

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# Siemens presents new technology for converter stations

In Munich today, Siemens will present its “full bridge technology,” which will be used in the latest generation of converter stations. In October, Siemens was already awarded a contract worth €900 million to build two converter stations for the ULTRANET direct-current project. Transmission system operators Amprion and TransnetBW will implement this, the first of three planned high-voltage direct current transmission (HVDC) links between northern and southern Germany – an important milestone for the country’s transition to a new energy mix. At the start and end of the links, the converters, with a transmission capacity of 2,000 megawatts (MW), will convert electricity from direct current (DC) to alternating current (AC) and back again. The use of the full bridge technology makes it possible to resolve faults in the DC sections quickly and flexibly with no need to switch the system off. It also stabilizes the AC grid at the same time.

The advantage of the converters developed by Siemens also lies in the high availability it provides for power transmission. The full bridge technology makes it possible to “carry on working” through line faults. The new technology allows faults on an overhead DC line to be resolved within the converter, which keeps the fault and its repercussions to a minimum. The basic principle is that faults in the grid must be rectified as quickly as possible to prevent them from spreading. Another advantage is what is known as **“**black start capability”. This refers to the ability to supply a part of the grid with electricity again following a power failure, for example, and thus avoid longer outages. The insulated gate bipolar transistors (IGBTs) used by Siemens can also act as a generator to help a grid segment that has lost power to recover autonomously, so they are also black start-capable. In general, HVDC offers many more fundamental advantages compared to AC transmission: the

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transmission capacity can be better controlled and losses on overhead lines are lower than with AC.

“The full bridge technology resolves faults extremely quickly and can reliably prevent grid faults from spreading to a blackout,” states Jan Mrosik, CEO of Siemens’ Energy Management Division. “With this innovative development, Siemens is providing the technology needed to successfully expand the grid and thus also ensure the success of the transition to a new energy mix.”

ULTRANET is a joint-venture project between Amprion and TransnetBW, and forms the southern part of one of the three planned HVDC corridors between northern and southern Germany. The connection covers a distance of 340 kilometers, from Osterath in North Rhine-Westphalia to Philippsburg in Baden-Württemberg.

HVDC technology is the first choice for the transmission of large volumes of energy across long distances with minimal losses. In Germany, electricity from remote offshore wind farms can be efficiently fed into the electricity supply network on-shore via HVDC. HVDC enables grids that use different frequencies to be reliably connected together and stabilized. As a transnational grid connection, HVDC permits the targeted exchange of power between separate countries or states.

Demand for HVDC is growing rapidly. The past 40 years have seen HVDC connections with a total capacity of more than 100 GW (equivalent to 100 large-scale power stations) installed world-wide. In this decade alone, Siemens estimates that a further 270 GW will be added to this total. It also estimates that the HVDC market will virtually double within five years from the current €3 billion p.a. Siemens has implemented more than 40 HVDC projects world-wide to date, one-fourth of these in China. The total amount of electricity that flows via these HVDC connections is comparable to the average electricity consumption of industrial countries such as Spain or Italy.

This press release and a press picture is available at
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