

Erlangen, April 24, 2018

Hannover Messe 2018, Hall 9, Booth D35

Wind farm places the first SF₆-free Siemens high-voltage switchgear (GIS) into operation

Siemens supplied four bays of the 8VM1 gas-insulated SF₆-free high-voltage switchgear (GIS) – which has a capacity of 72.5 kilovolts (kV) – to Siemens Gamesa Renewable Energy. The systems were deployed in the Nissum Bredning Vind wind farm in Denmark. The switchgear protect the wind turbines from overloads and short circuits and thereby ensure an uninterruptible power supply. The metal-encapsulated 8VM1 from the blue GIS portfolio was developed specifically for use in offshore wind turbines. They work with the proven vacuum circuit-breaker technology and with clean air as the insulating medium instead of sulfur hexafluoride (SF₆). The wind farm operators, Nissum Bredning Vindmøllelaug and Jysk Energ, are relying on a new cable and turbine concept at a voltage of 66 kV to connect the four seven-megawatt (MW) wind turbines from Siemens to the grid. Compared with the usual 33-kV grid connection, this new concept increases transmission capacity and lowers the cost of laying cables. The wind farm has been supplying electricity since March.

In the future, 66 kV could be the standard voltage for offshore turbines. A higher voltage means lower cable-laying costs and also fewer losses. The “cable in pipe” solution also makes it possible to simplify cabling between the turbines. A slimmed-down tower concept helps save even more material. In this case, reduced-weight prototypes that are specially suited to jacket concepts are to be installed.

The economic prospects of the offshore wind energy technology being tested in the project are expected to demonstrate a significant positive impact on power generation costs. The Danish energy agency DEA anticipates that the components being tested in Nissum Bredning will help substantially to save on investment and operating costs.

The 8VM1 blue GIS is an enhancement of the switchgear that use SF₆ as the insulating, switching, and extinguishing gas, and which will remain in the product line. “We’re proud that our new SF₆-free switchgear are being used successfully in the Nissum Bredning Vind wind farm,” said Karlheinz Kronen, CEO of the High Voltage Products Business Unit in the Siemens Energy Management Division. “We’ve constructed the 8VM1 specifically for this type of deployment and focused on an environmentally compatible design during development. Customers will therefore benefit from the advantages of our proven vacuum switching technology with no SF₆.” In vacuum switching technology, a vacuum-interrupter unit switches and extinguishes the arc, while technically prepared and purified air in a mixing ratio of 80 percent nitrogen to 20 percent oxygen (known as clean air) provides the insulation for the current-carrying conductors inside the housing of the metal-encapsulated gas-insulated switchgear (GIS). By combining vacuum-interrupter units of up to 72.5 kV for extinguishing arcs with dry air (clean air) as the high-voltage insulating medium, we’ve added another alternative to SF₆ to our existing insulating and extinguishing technology.

The new blue GIS portfolio is Siemens’ answer to the market requirements of customers who want to use both the proven properties of GIS systems as well as a natural insulating medium in their power grids. The blue GIS portfolio represents Siemens’ work with insulating media that contain no fluorine gases and therefore meet all the strictest safety and environmental standards.

This press release and a press picture is available at

www.siemens.com/press/PR2018040246EMEN

For further information on Division Energy Management, please see

www.siemens.com/energy-management

For further information on blue GIS, please see

www.siemens.com/global/en/home/products/energy/ecotransparency.html

Contact for journalists

Heiko Jahr

Phone: +49 9131 7 295 75; E-mail: heiko.jahr@siemens.comFollow us on Twitter at: www.twitter.com/siemens_press

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