

Ancillary Services from Wind Power

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Presenter: Anca Daniela Hansen

In this session, Anca Daniela Hansen, a senior researcher in DTU wind energy department, did a presentation about ancillary services from wind power. She started introducing the concept and classification of ancillary services defined by CIGRE, ENTSO-E and Energinet. The ancillary services are responsible for providing support to the power systems and to ensure that the power system operates securely. For example, CIGRE classifies the ancillary services as: primary frequency control, secondary control, tertiary reserves, voltage control and black start capabilities. Recently, ENTSO-E has included power oscillation damping and system inertia as additional factors to consider. The grid codes describe different requirements based on the technical capabilities of the wind power plants. Horn Rev was the first offshore wind farm to provide ancillary services. The Danish TSO has also defined requirements in terms of fault ride through and power control capabilities.

Anca presented some past and ongoing research projects in ancillary services and emphasized the importance to include them in modern wind power plants. The wind turbine control functionalities traditionally have maximized the active power generation and reduced the mechanical stress. At wind power plant level, the integration of the wind turbines have to be optimized and the costs associated to the grid code requirements have to be reduced. Therefore, the wind power plant has a general architecture based on three main blocks: wind power plant control, dispatch and wind turbine control. Anca described some examples comparing active stall wind turbines (ASWT) and variable speed wind turbines (DFIG/ PMSG) in terms of power control, voltage control and frequency control capabilities to provide grid support. Also, there is special interest in inertia response, power system damping and synchronizing power as enhanced ancillary services. Anca finished her presentation with the future challenges and she introduced a new project in ancillary services from renewable power plants called RePlan.

Marc Cheah