

The dispatch and control technologies of renewable energy in China

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Abstract

Wind power develops rapidly in china, and the growth rate in 2009 is much higher than the world average level. China's newly installed capacity of wind power in 2009 was 13000MW. Because wind power is random and intermittent, and sometimes its output show anti-regulation characteristics against load, how to make a harmonious relationship between wind power and power grids has become the key issue in China. Two of efforts are presented in this paper.

One is from the viewpoint of power grid. In case of North-West Grid of China, it has integrated large-scale wind power, and is developing a grid dispatching support system to achieve the friendly integration of wind power. In detail, the system includes many functions: data acquisition of wind power, wind power prediction, wind farm control, assessment of admissible wind power, assessment of wind power ancillary services, data analysis and presentation of wind power, and etc.

The other is from the viewpoint of power supply. The energy storage technology is being used to smooth the fluctuations of wind and/or solar power. Specifically, wind-solar-battery hybrid generation (WSBHGS) that includes large-scale battery energy storage systems have been proposed. Moreover, State Grid Corporation of China is building a wind-solar-battery power demonstration base in the city of Zhangjiakou, which includes 100MW wind-power, 50MW PV-power and 20MW chemical storage device. As one part of the power system, the control system of the WSBHGS has been developed simultaneously. The control system includes the following parts: data acquisition of wind-solar-battery power, automatic generation control (AGC), automatic reactive power and voltage control (AVQC) , the wind-solar-battery dispatching, and etc.