Tatyana Chernova (MSc student, Skoltech)

"A unified framework for frequency control and congestion management"

Abstract. The existing frequency control framework in power systems is challenged by penetration of both distributed energy sources and active demand devices. In this talk a new framework for frequency control and congestion management will be discussed. We formulate the controller design as an optimization problem that rebalances power, restores the nominal frequency and inter-area flows, and maintains line flows below their limits in a way that minimizes the control effort (disutility to the agents participating in control). Simulation results demonstrate the ability of designed algorithm to achieve control goals and suggest a possible move from the current N-1 preventive dispatch towards N-0 corrective dispatch. Besides that in the talk we consider a hybrid scheme which combines traditional and proposed unified methods of frequency control as a way of gradual transition to a new control mechanism.

Bio. Tatiana received the Specialist degree in Electronic Systems and Devices from Bauman Moscow State Technical University, Russia, in 2014. Her research is on modern methods of target tracking, methods for data association, immunity level estimation of communication systems and power system dynamics. Currently she is a second year Master student in Skoltech, Energy department. She got Russian Government Grant for students, 2012, 2014.