Abstract:
It is widely accepted, among researches in the power system area, that iron saturation in synchronous machines plays an important role in their stability calculations, both for steady state and transient. At first, the machine modeling methods represented the saturation effects by modifying the machine’s direct (d-) and quadrature (-q) axis reactance with either one or two factors that were only dependent on the machine open-circuit test characteristics. Another modeling method represented the saturation effects by using methods of finite element and finite difference to determine the flux distribution inside the machine. These finite methods are very unpractical because of very high computational requirements. All of these methods ignore the effects of mutual magnetic coupling between the axes. Later, it was proved that this mutual magnetic coupling, now known as cross-magnetizing effects, always accompanies saturation in synchronous machines. Its effects are notable; therefore must be taken into account in saturation studies. The effects of saturation are becoming more and more significant, because generators have been getting more saturated over time resulting in increased errors.

About the presenter:
Oskar Reynisson received his BSEE from University of Iceland in 2007. He worked as a design engineer at Rafteikning, consulting engineers, in Reykjavik, Iceland, for one and a half years. He is currently finishing the first year of his masters degree under guidance of Dr. Bruce Mork. His area of interest includes EMPT/ATPdraw modeling and power system transients.