

Tipo di tesi: Laurea Magistrale

Corso di Laurea: Ingegneria

Tipologia: teorica

Titolo della tesi: Study and modelling of a turbine-generator for the EU DEMO fusion power plant

Proponente: A. Ferro / F. Gasparini

Relatore Accademico: P. Bettini

Capogruppo: E. Gaio

Argomento della tesi:

The DEMO fusion power plant will be the first fusion reactor to produce net electrical power to be delivered to the European Power Transmission Grid (PTG). DEMO specifications request the power plant to be able to produce at least 300 MW of net electrical power. However, to create and sustain a fusion grade plasma, hundreds of MW of electrical power are needed, which are referred to as recirculating power. Thus, the electrical generator of the plant will produce a gross electrical power of about 800 MW and, so, the electrical generator of DEMO will be rated for about 1 GVA. Generator of such power level are already available on the market and exploit well established technologies. Nonetheless, the DEMO generator could be subjected by anomalous electromechanical stress, since the recirculating power will feature huge power peaks with high power derivatives. The thesis, will focus on the setup of a model, based on the state-space representation, of the generator itself. Then, a rather simplified model of the steam turbine dynamic should be developed and integrated with the generator one. Finally, the closed loop control system of the turbine-generator group should be implemented in the model and, thus, the behavior of the overall system analyzed.

Competenze richieste (se necessarie): Macchine elettriche, azionamenti elettrici

Data della proposta:

Stato: non assegnata/assegnata

Laureando/a: (quando sarà assegnata)