

Analysis of electric power grid due to operation of large nuclear fusion facility (NFF)

Abstract

Several Tokamak devices are being built worldwide to verify the engineering feasibility of controlled nuclear fusion. The tokamak reactor includes superconducting magnets, heating devices, etc. which requires sudden large power pulse from the electric power utility. Hence, grid would be subjected to power shocks. This would result in grid voltage and frequency oscillations, power surge on generators, etc. Sudden and frequent large power demand would result in issues of voltage and power stability, low frequency oscillations, voltage flickers and tripping of big power feeders which may even cause detrimental effect such as grid collapse. Forced oscillations is a crucial event and needs to be analysed properly. The project would consider a standard bus system and analyse the various effects on the grid due to fusion reactor operations. Simulation of the project would be performed in MATLAB Simulink/PSCAD/ETAP. The project would also focus on selection of static var compensations (SVC) for mitigating the fluctuation in busbar voltages.

Academic Project Requirements:

1) Required No. of student(s) for academic project: 1

2) Name of course with branch/discipline: M.E./M.Tech Electrical

3) Academic Project duration:

(a) Total academic project duration: 36 Weeks

(b) Student's presence at IPR for academic project work: 3 Full working Days per week

**Email to: aritra.chakraborty@ipr.res.in[Guide's e-mail address] and
project_ee@ipr.res.in [Academic Project Coordinator's e-mail address]**

Phone Number: 079 -2271 [Guide's phone number]