ELG3311: Electric Machines and Power Systems Lab 4: Simulation of a Turbo-Generator

<u>Objective</u>

- To understand the operation of a complex power system consisting of several components.
- To implement the SIMULINK simulation of a turbo-generator.
- To learn how to use SIMULINK toolbox.

Background Knowledge

- Familiarize yourself with SIMULINK before the lab session. The Online Help provides complete information on its usage.
- Review Chapter 3 and 5 of the text book.
- Extensively, read the paper entitled "A Simulation-Based Design Study for a Locomotive Electric Power System", which is available on your course website. The task of this lab is based on this paper.
- Try to find more materials (papers, books, etc.) on power systems and related modeling techniques. (If you are using computers in the campus network, you can access many publications, such as those from IEEE/IEE, for free. Check the University of Ottawa library network.)

Task Description

- You are expected to write a mini-report (~3 pages, 10 pts & 1.5 line spaces) to describe the configuration, operation and modeling of the power system presented in the above reference paper.
 - Describe the system with your own language and knowledge from the lecture, the textbook and other literature references.
 - > Describe the techniques and difficulties to model such a system.
 - ➢ Write it concisely and clearly.
- You are expected to build a SIMULINK model to investigate the operation characteristics of the **turbo-generator** as described in the above reference paper.
 - You may utilize the SIMULINK models in Page 2/3 of the reference paper.
 - > You don't need to model other components of the system.
 - > Simplification on the controller part is allowed.

Evaluation

- 1. Each student should do the work (no groups).
- 2. All students belonging to the Tuesday session should go to the lab at SITE on Nov 1, 2005. The other three groups will follow accordingly. The TAs will help you with SIMULINK modeling.
- 3. The student must demonstrate the simulation results of Lab 3 and Lab 4 with the TA at the end of the lab session. The TA will check, model and examine the results, and evaluate the demonstration.