

ECE473 CONTROL OF POWER SYSTEMS

Lab # 1 - Economic Dispatch

This lab will use the software in the **POWERGEN** package. Create a folder called **POWERGEN** on your **C:** drive, then copy the folder from the jump drive. To run the software:

- i) Double-click on the **POWERGEN** icon.
- ii) Double-click on the **EDC.EXE** icon.
- iii) You will be asked if you want to output to the printer.
- iv) You will be asked for an input file.

Initially work through example 3A, which is in the course notes. Do this by loading the file called EX3A.DAT. The file is configured for the lambda search method, so enter "1". The example called for 850 MW of load so enter "2", followed by 850. Confirm that the results you get are the same as example 3A. Exit the program and load EX3A.DAT into a file editor (Notepad, WordPad etc.) and observe its structure.

When you understand the file structure, use the file editor to modify the data for the example on the reverse page. Be sure to save the data under a **new filename** or you will wipe-out EX3A.DAT.

Determine the following for each of the three load levels specified:

- System incremental running cost.
- Average energy cost.
- Capacity available for sales (needed to purchase) if the loss of the largest unit has to be covered.
- The annual value of the foregoing transactions if the system incremental cost of the neighboring utility is constant at \$60.00/MWh and electricity is transacted at the average of the two system incremental costs. Note that because of "incremental creep", you will have to determine two values of your system incremental cost, one before the transaction and one after. Use the average of these values and then average it with \$60.00 from the neighboring utility.

Arrange the results in tabular form and attach the tables to a memo that describes them and summarizes your conclusions.

Unit #	Min MW	Max MW	F(P)
1	400	1000	$500 + 3P + 0.003P^2$
2	100	550	$600 + 4P + 0.006P^2$
3	300	750	$200 + 2P + 0.002P^2$
4	150	850	$400 + 6P + 0.001P^2$
5	50	350	$100 + 5P + 0.005P^2$
6	150	1050	$600 + 4P + 0.003P^2$
7	65	475	$250 + 6P + 0.008P^2$
8	125	650	$800 + 4P + 0.004P^2$
9	450	1250	$900 + 7P + 0.009P^2$
10	400	1150	$450 + 8P + 0.002P^2$

