

King Fahd University of Petroleum & Minerals
Electrical Engineering Department

EE463 Power System Analysis
Course Project

The 26- bus power system network of an electric utility company is shown in page 254 of your text book.

• **Part I: Power System Flow**

1. Using the power flow program, run a base-case power flow. In addition, to the printed input/output data files, show on a separate copy of the single-line diagram the per unit bus voltages as well as real and reactive line flows, generator outputs, and loads
2. If the line between bus 13-15 and bus 6-7 are lost, run the load flow again and explain the impact on the network. Show on a separate copy of the single-line diagram the per unit bus voltages as well as real and reactive line flows, generator outputs, and loads. Flag any high/low bus voltages for which $0.95 \leq V \leq 1.05$ pu is violated, and any lines or transformer flows that exceed normal ratings.
3. Consider growth of energy load demand 6% per year, what is the impact on the bus voltages after ten years. Flag any high/low bus voltages for which $0.95 \leq V \leq 1.05$ pu is violated, and any lines or transformer flows that exceed normal ratings. Suggest adding static capacitor in some location on the network to boost the voltage drop.
4. Provide a typed report and summary of your results along with your calculations for the work above, the printed power flow input/output data, and copies of the single-line diagram. The report is to be in standard professional engineering format.