Lecture 2

The Load Flow Problem

- There are two methods of solving the load flow problem.

    - A)   The Gauss Seidel Method
    - B)   The Newton Raphson Method

The Gauss-Seidel Method

- This method solves, by an iterative process, the following equation that represents a power system having N buses

$$V_k\left(i+1\right) = \frac{1}{Y_{kk}}\left[\frac{P_k - jQ_k}{V_k^*\left(i\right)} - \sum_{n=1}^{k-1}Y_{kn}V_n\left(i+1\right) - \sum_{n=k+1}^{N}Y_{kn}V_n\left(i\right)\right]$$

GPL'S POWER SYSTEM

- GPL'S power system, with an installed capacity of 105 MW,

THE OBJECTIVES OF THIS STUDY WERE AS FOLLOWS:

- To model the (GPL'S) Demerara system for load flow studies.
- To perform load flow studies on GPL's present Demerara 60 Hz system.
- To use a static model of the frequency converters and perform studies on the Demerara 50 and 60 Hz system.
- To perform load flow studies on GPL's future Demerara power system (all load converted to 60 Hz.).
- To analyse the results of the load flow studies.

Demerara Interconnected System Data

- Installed Capacity – 76 MW

- Peak Load - 67 MW

- Three power stations, two at Garden of Eden and one at Versailles, generating at 13.8 kV, 60Hz

- Two power stations at Kingston generating at 11 kV, 50 Hz