Lecture 3

The Newton-Raphson Method

- The Newton-Raphson method solves the nonlinear equation **y** = **f**(**x**) where the **x**, **y** and **f** vectors for the power flow problem are defined as

-

$$Y_k = P_k = P_k(x) = V_k \sum_{n=1}^{N} Y_{kn} V_n \cos(\delta_k - \delta_n - \theta_{kn})$$

$$Y_{k+N} = Q_k = Q_k(x) = V_k \sum_{n=1}^{N} Y_{kn} V_n \sin(\delta_k - \delta_n - \theta_{kn})$$

$$k = 2,3,......N$$

Single Line Diagram of the Demerara Interconnected System

KINGSTON B

3X12.5MVA

11 KV

6.25 MVA

11 KV/4KV

11 KV

2X6.87MVA

2X6.87 MVA

DEMERARA POWER KINGSTON

SOPHIA 11KV

11 KV

SOPHIA 13.8KV

12.5MVA 12.5MVA 11(50Hz)/13.8(60Hz) KV

SOPHIA 69KV

16.7 MVA 16.7 MVA 16.7 MVA 13.8/69KV

69 KV

69 KV

16.7 MVA 16.7 MVA 16.7 MVA 69/13.8KV

2X6.87 MVA

13.8 KV

DEMERARA POWER GOE

2X6.87 MVA

13.8 KV

GOE

2X6.6257 MVA

VERSAILES

2X2.5 MVA

REVISIONS

GUYANA POWER & LIGHT
DEMERARA INTERCONNECTED SYSTEM AS OF 2006 -
DEMERARA INTER-CONNECTED SYSTEM SINGLE LINE DIAGRAM

NO. DATE DESCRIPTION

DATE ORIGINAL

SCALE
NOT TO SCALE

LATEST REVISION JOB NO. CHECKED DRAWN