



IIT ROORKEE



**NPTEL ONLINE
CERTIFICATION COURSE**

Computer aided power system analysis

Introduction to Contingency Analysis

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CONTINGENCY ANALYSIS

Contingency

→ Outage of an electrical element in the power grid.

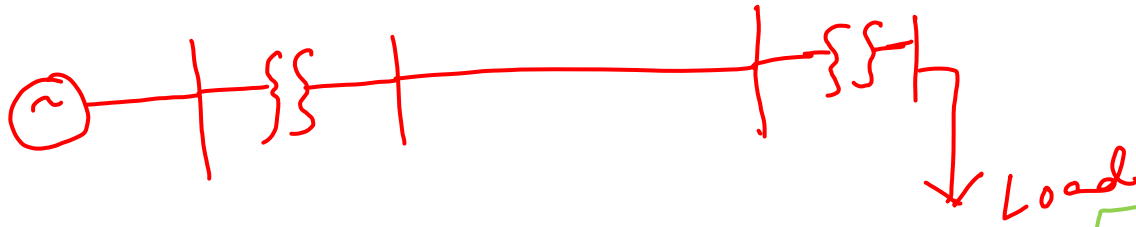
Four different major equipments

- i) Generator
- ii) Transmission line
- iii) Transformer
- x iv) Loads

→ Help in supplying electric power to the loads.

→ Consume electric power





$$|I_{ij}| \leq I^{\max}$$

Contingency
outage of

- └─ Generator
- └─ Transmission line

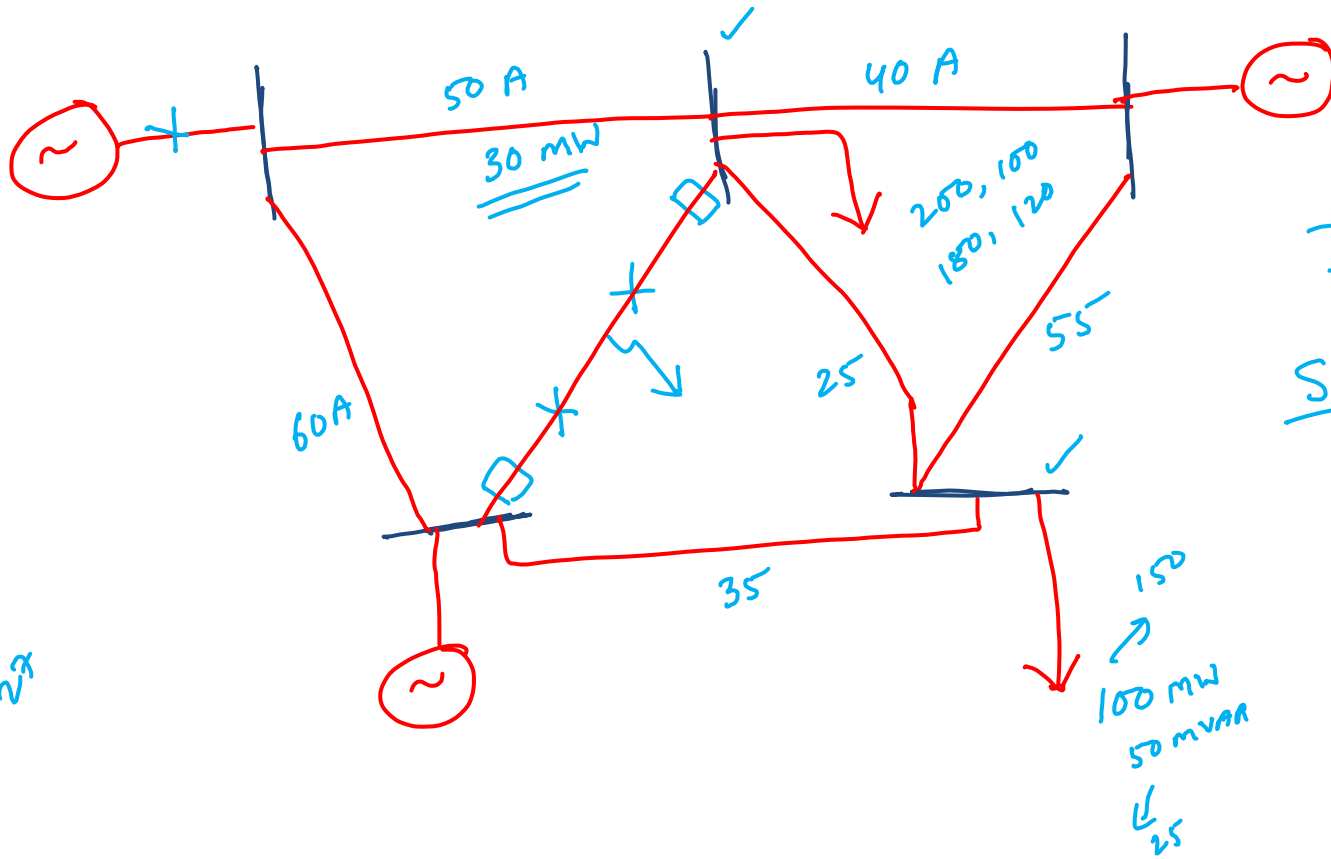
$$V^{\min} \leq |V| \leq V^{\max}$$

$$P_{ij} \leq P_{ij}^{\max}$$

$$Q_{ij} \leq Q_{ij}^{\max}$$

Load-flow → Voltage magnitudes, $\angle \theta$,
 P_{ij} , Q_{ij} , $|I_{ij}|$





$(N-1)$ contingency

$$\begin{array}{r} 100 \text{ G.} \\ 1000 \text{ L.} \\ \hline N = 1100 \end{array}$$

1100

$$\begin{array}{r} 10000 \rightarrow TL \\ 1000 \rightarrow G_2 \\ \hline 11000 \rightarrow N \end{array}$$

