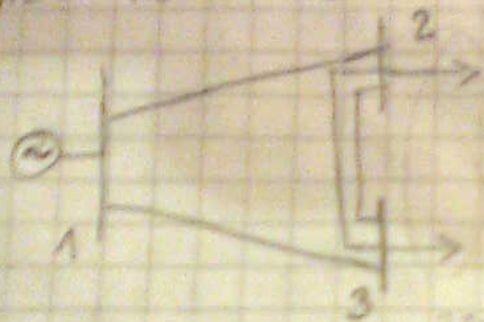


AES - "AUSTROEN"



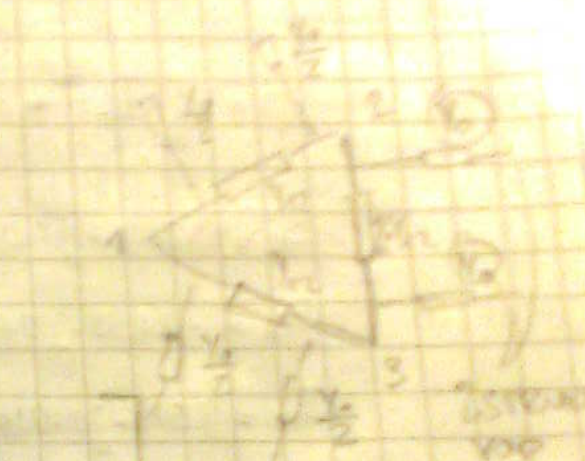
30 Vrednoti: T-Model

$$Y_{12} = \frac{1}{(R + jX) \cdot l}$$

$$Y_{1n} = (C + jB) \cdot l \cdot \frac{V_n^2}{S_0}$$

$$= 3.978 - j41.577 \text{ p.u.}$$

$$\frac{Y}{2} = \frac{C + jB}{2} \cdot \frac{V_n^2}{S_0} = 1.003 \text{ p.u.}$$



$$V_n = 110 \text{ kV}$$

$$R_n = 0.12 \text{ } \Omega/\text{km}$$

$$X_n = 0.41 \text{ } \Omega/\text{km}$$

$$B_n = 0.0028 \text{ mS/km}$$

$$l = 20 \text{ km}$$

$$V_1 = 110 \angle 0^\circ \text{ kV}$$

$$V_2 = 108.95 \angle -1.35^\circ \text{ kV}$$

$$V_3 = 108.053 \angle -1.39^\circ \text{ kV}$$

$$S_0 = 100 \text{ MVA}$$

$$Y = \begin{bmatrix} 2 \cdot 1.003 - 2 \cdot \frac{Y}{2} & -Y_{12} & -Y_{12} \\ -Y_{12} & 3 \cdot \frac{Y_{12}}{2} + 3 \cdot \frac{Y}{2} & -2 \cdot \frac{Y_{12}}{2} \\ -Y_{12} & -2 \cdot \frac{Y_{12}}{2} & 3 \cdot \frac{Y_{12}}{2} + 3 \cdot \frac{Y}{2} \end{bmatrix}$$

$$Y = \begin{bmatrix} 18.778 \angle 33.683^\circ & 14.162 \angle 106.313^\circ & 14.162 \angle 106.313^\circ \\ & 42.576 \angle 33.682^\circ & 18.524 \angle 106.313^\circ \\ & & 42.576 \angle -33.682^\circ \end{bmatrix}$$

a) Y-MATRIKA

b) INDEKSITE SNAGE
U SVAKOJ TAČCI

КУРСОВИ НАПОМЕНЕ

$$b) P_i = |U_i| \sum_{j=1}^n |U_j| Y_{ij} \cos(\delta_i - \delta_j - \theta_{ij})$$

— BUT ELEMENTAL Y-MATRICE

$$Q_i = |U_i| \sum_{j=1}^n |U_j| Y_{ij} \sin(\delta_i - \delta_j - \theta_{ij})$$

$$|U_1| = 1 \text{ p.u.} \quad |U_2| = 0.933 \text{ p.u.} \quad |U_3| = 0.934 \text{ p.u.}$$

$$P_1 = 1.000 \text{ p.u.} = 100.0 \text{ MW}$$

$$P_2 = -0.972 \text{ p.u.}$$

$$P_3 = -0.939 \text{ p.u.}$$

$$Q_1 = 0.000 \text{ p.u.} = 0.0 \text{ MVar}$$

$$Q_2 = -0.933 \text{ p.u.}$$

$$Q_3 = 0.033 \text{ p.u.}$$

c)

$$\Delta S = S_{ij} + S_{ji}$$

NODE ELEMENT MATRICE

НОДОВЫХ ЭЛЕМЕНТАРНЫХ

ПЕРЕМЕННЫХ

$$S_{ij} = U_i \cdot I_{ij}^* = U_i \left[(U_i - U_j) \cdot Y_{ij} + U_j \cdot Y_{i0} \right]^*$$

$$S_{ji} = U_j \cdot I_{ji}^* = U_j \left[(U_j - U_i) \cdot Y_{ji} + U_i \cdot Y_{j0} \right]^*$$

$$S_{12} = 0.504 + j0.034 \text{ p.u.}$$

$$S_{21} = -0.439 - j0.043 \text{ p.u.}$$

$$\Delta S = \Delta S_{12} + \Delta S_{21} + \Delta S_{33}$$

$$P_1 = 1.005 \text{ p.u.} = 100.5 \text{ MW}$$

$$P_2 = -0.502 \text{ p.u.}$$

$$P_3 = -0.498 \text{ p.u.}$$

$$Q_1 = 0.003 \text{ p.u.} = 0.3 \text{ MVAR}$$

$$Q_2 = -0.033 \text{ p.u.}$$

$$Q_3 = 0.033 \text{ p.u.}$$

c)

$$\Delta S = \Delta S_1 + \Delta S_2$$

NINE ELEMENT MATRIX
NEGATIVE SIGN
BEFORE CURRENT

$$S_1 = V_1 \cdot I_1^* = V_1 [(V_1 - V_2) \cdot Y_{12} + j \cdot P]$$

$$S_2 = V_2 \cdot I_2^* = V_2 [(V_2 - V_1) \cdot Y_{21} + j \cdot P]$$

$$S_{12} = 0.504 + j0.024 \text{ p.u.}$$

$$S_{21} = -0.499 - j0.013 \text{ p.u.}$$

$$S_{13} = 0.504 - j0.016 \text{ p.u.}$$

$$S_{31} = -0.499 - j0.026 \text{ p.u.}$$

$$S_{23} = -0.003 - j0.036$$

$$S_{32} = 0.003 + j0.023$$

$$\Delta S = \Delta S_{12} + \Delta S_{13} + \Delta S_{23}$$

$$\Delta S = 0.01 + j0.008 \text{ p.u.}$$

$$\Delta S = 1.017 + j0.806 \text{ MVA}$$