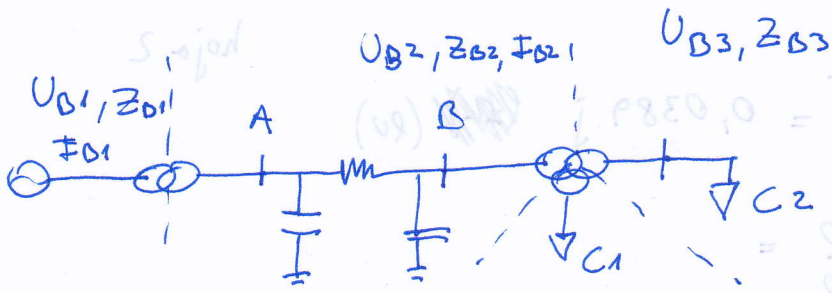


Elección de Bases

$S_B = 100$ MVA

$U_{B1} = 14$ kV , $U_{B2} = 150$ kV , $U_{B3} = U_{B2} \times \frac{66}{160} = 61{,}88$ kV

$U_{B4} = U_{B2} \cdot \frac{31{,}5}{160} = 29{,}53$ kV

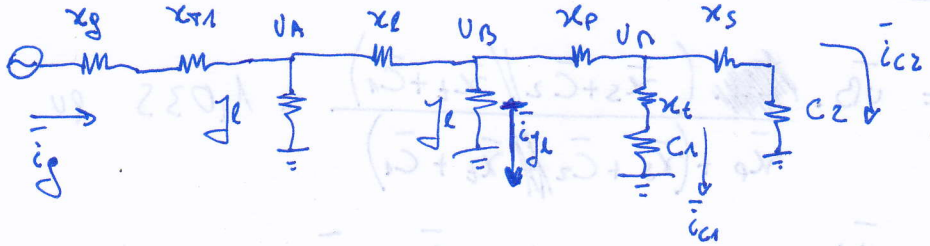
$Z_{B1} = \frac{U_{B1}^2}{S_B} = 1{,}96\ \Omega$, $Z_{B2} = \frac{150^2}{100} = 225\ \Omega$, $Z_{B3} = \frac{61{,}88^2}{100} = 38{,}29\ \Omega$

$Z_{B4} = \frac{29{,}53^2}{100} = 8{,}72\ \Omega$

$I_{B1} = \frac{S_B}{\sqrt{3}\ U_{B1}} = 4120$ A , $I_{B2} = \frac{100 \times 1000}{\sqrt{3} \cdot 150} = 385$ A

$I_{B3} = \frac{100 \times 1000}{\sqrt{3} \cdot 61{,}88} = 933$ A ; $I_{B4} = \frac{100 \times 1000}{\sqrt{3} \cdot 29{,}53} = 1955$ A

Modelo del sistema en pu



$$\bar{x}_g = 0,04j \times \frac{13,8^2}{14^2} = 0,0389\,j \quad (pu)$$

$$\bar{x}_{T1} = 0,06j \times \frac{100}{110} =$$

$$\bar{x}_\ell = \frac{1,6\times10^{-3} \times 2.\pi.50 \times 50.}{Z_{B2}} j = 0,112j \quad (pu)$$

$$\bar{j}_\ell = \frac{1}{2} \cdot 0,0112\times10^{-6} \times 2\times\pi\times50\times50\times Z_{B2}\cdot j = 0,0198j \quad (pu)$$

$$\bar{x}_{ps} = 0,04 \times \frac{160^2}{150^2} j = 0,0455j \quad (pu)$$

$$\bar{x}_{pt} = 0,06 \times \frac{160^2}{150^2} j = 0,0683j \quad (pu)$$

$$\bar{x}_{st} = 0,05 \times \frac{160^2}{150^2} j = 0,0569j \quad (pu)$$

$$\bar{x}_p = 0,0284\,j \quad (pu)$$

$$\bar{x}_s = 0,0171\,j \quad (pu)$$

$$\bar{x}_t = 0,0398\,j \quad (pu)$$

$$\bar{C}_1 = \left(\frac{31,5^2}{5}\right) \cdot \frac{j}{Z_{B4}} = 22,8j \quad (pu)$$

$$\bar{C}_2 = \left(\frac{66^2}{15}\right) \cdot \frac{j}{Z_{B3}} = 7,59\,j \quad (pu)$$

$$UB = \frac{156}{150} = 1,04 \quad (pu)$$ Tensión Barra B

Tensión en el punto medio del Tramo de 3 circuit.

$$\bar{U}N = \bar{U}B \cdot \frac{\left(\bar{x}_s + \bar{C}_2 // \bar{x}_t + \bar{C}_1\right)}{\bar{x}_p + \left(\bar{x}_s + \bar{C}_2 // \bar{x}_t + \bar{C}_1\right)} = 1,035 \quad pu$$

$$\bar{i}_{C1} = \frac{\bar{U}N}{\bar{x}_t + \bar{C}_1} = -0,0454j \quad (pu) \qquad \bar{i}_{C2} = \frac{\bar{U}N}{\bar{x}_s + \bar{C}_2} = -0,136j \quad (pu)$$

$$\bar{i}_{y\ell} = \bar{U}_B \cdot \bar{j}_\ell = 0,0206j \quad (pu) \qquad \bar{U}A = \bar{U}B + \left(\bar{i}_{C1} + \bar{i}_{C2} + \bar{i}_{y\ell}\right) \times \bar{x}_\ell =$$

$$= 1,058 \quad (pu)$$

$$\bar{i}_g = \bar{U}A \cdot \bar{J}_\ell + \bar{i}_{c1} + \bar{i}_{c2} + \bar{i}_{y_\ell} = -0{,}14\,j \quad (PU)$$

$$I_{c1} = i_{c1} \cdot I_{B4} = 88{,}76 \text{ A}$$

$$I_{c2} = i_{c2} \cdot I_{B3} = 127 \text{ A}$$

$$I_j = i_g \cdot I_{B1} = 577 \text{ A}$$