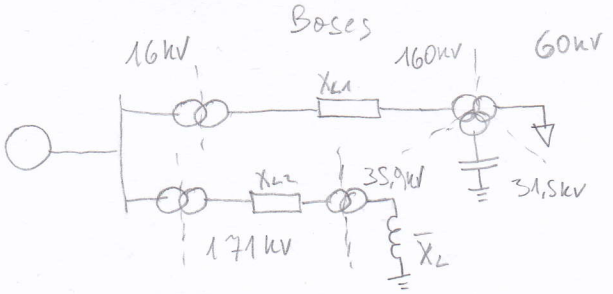


$S_B = 10$ MVA

$P = 1 + \frac{n}{10}$ (pu) $\Rightarrow \bar{S} = P \cdot (1 + 0{,}484j)$

$\bar{X}_P = 0{,}02j$; $\bar{X}_S = 0{,}07j$; $\bar{X}_t = 0{,}05j$ (pu)

$\bar{X}_{L1} = \frac{0{,}1j}{160^2/10} = 3{,}9 \times 10^{-5} j$ (pu)

$\bar{X}_{L2} = \frac{0{,}1j}{171^2/10} = 3{,}42 \times 10^{-5} j$ (pu)

$\bar{X}_{T1} = 0{,}02 \times \frac{150^2}{160^2} \times \frac{10}{18} = 9{,}77 \times 10^{-3} j$ (pu)

$\bar{X}_{T3} = 0{,}03 \times \frac{155^2}{171^2} \times \frac{10}{6} = 0{,}0411 j$ (pu)

$\bar{X}_{T4} = 0{,}03 \times \frac{150^2}{171^2} \times \frac{10}{6} = 0{,}0385 j$ (pu)

$\bar{X}_C = \frac{1/(100\pi \cdot 3{,}2 \times 10^{-6} j)}{31{,}5^2/10} = -10j$ (pu)

$X_L = \frac{100\pi \cdot 1{,}05}{35{,}9^2/10} = 2{,}56j$ (pu)

$\bar{X}_G = 0{,}09 \times \frac{14^2}{16^2} \cdot \frac{10}{20} = 0{,}0345 j$ (pu)

$i_{nT1} = \frac{18}{\frac{\sqrt{3} \cdot 150}{10}} = 1{,}92$ (pu)

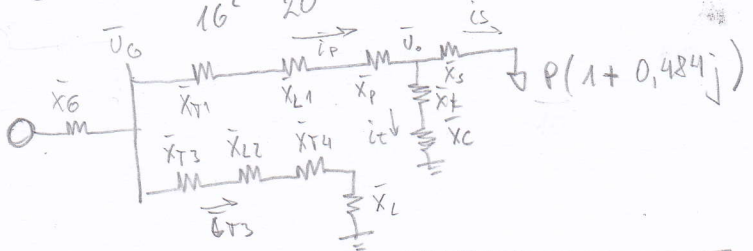
$i_{nT2P} = \frac{18}{\frac{\sqrt{3} \cdot 160}{10}} = 1{,}8$ (pu)

$i_{nT2S} = \frac{18}{\frac{\sqrt{3} \cdot 60}{10}} = 1{,}8$ (pu)

$i_{nT3} = \frac{6}{\frac{\sqrt{3} \cdot 155}{10}} = 0{,}662$ (pu)

$i_{nT4} = \frac{6}{\frac{\sqrt{3} \cdot 31{,}5}{10}} = 0{,}684$ (pu)

$i_{nG} = \frac{20}{\frac{\sqrt{3} \cdot 14}{10}} = 2{,}29$ (pu)



$\bar{i}_S = \frac{P \cdot (1 - 0{,}484j)}{1{,}05} = P \cdot (0{,}952 - 0{,}461j)$ $\Rightarrow i_S = 1{,}05 \cdot (1 + \frac{n}{10}) < 1{,}8$

$n < 7{,}14 \Rightarrow n = 8 \Rightarrow$ No 8

$\bar{U}_o = U_1 + \bar{i}_S \cdot \bar{X}_S = 1{,}05 + P(0{,}952 - 0{,}461j) \cdot 0{,}07j \Rightarrow \bar{U}_o = 1{,}05 + P \cdot (0{,}0666 - 0{,}0323j)$

$\bar{i}_t = \frac{\bar{U}_o}{\bar{X}_t + \bar{X}_C} = \frac{1{,}05 + P(0{,}0666 - 0{,}0323j)}{0{,}05j - 10j} = 0{,}106 j + P(3{,}25 \times 10^{-3} + 6{,}69 \times 10^{-3} j)$

$$\bar{i}_p = \bar{i}_s + \bar{i}_t = p\cdot(0{,}952 - 0{,}461j) + 0{,}106j + p(3{,}25\times10^{-3} + 6{,}69\times10^{-3}j)$$

$$\boxed{\bar{i}_p = 0{,}106j + p(0{,}956 - 0{,}454j)}$$

$n=7 \Rightarrow \bar{i}_p = 1{,}63 - 0{,}666j$

$i_p = 1{,}76 \angle 1{,}8$

$n=8 \Rightarrow \bar{i}_p = 1{,}72 - 0{,}711j$

$i_p = 1{,}86$ /

año 8 para T2

$n=9 \Rightarrow \bar{i}_p = 1{,}82 - 0{,}757j \Rightarrow i_p = 1{,}97 > 1{,}92$

año 9 para T1

$$\bar{U}_G = \bar{U}_0 + \bar{i}_p\cdot(\bar{X}_{T1} + \bar{X}_{L1} + \bar{X}_p)$$

$$= 1{,}05 + p(0{,}0666 - 0{,}0323j) + \left[0{,}106j + p(0{,}956 - 0{,}454j)\right]\cdot\underbrace{(9{,}77\times10^{-3}j + 3{,}9\times10^{-3}j + 0{,}02j)}_{0{,}0298j}$$

$$\boxed{\bar{U}_G = 1{,}047 + p(0{,}08 - 3{,}8\times10^{-3}j)}$$

$$\bar{i}_{T3} = \frac{\bar{U}_G}{\bar{X}_{T3} + \bar{X}_{L2} + \bar{X}_{T4} + \bar{X}_L} = \frac{1{,}046 + p(0{,}08 - 3{,}8\times10^{-3}j)}{0{,}0411j + 3{,}42\times10^{-5}j + 0{,}0385j + 2{,}56j} =$$

$$\boxed{\bar{i}_{T3} = -0{,}396j + p(-1{,}44\times10^{-3} - 0{,}0303j)} \quad (p.u)$$

$$\bar{i}_G = \bar{i}_p + \bar{i}_{T3} = 0{,}106j + p(0{,}956 - 0{,}454j) - 0{,}396j + p(-1{,}44\times10^{-3} - 0{,}0303j)$$

$$\boxed{i_G = -0{,}29j + p(0{,}955 - 0{,}484j)}$$

$n=11 \quad \bar{i}_G = 2 - 1{,}3j \Rightarrow i_G = 2{,}39 > 2{,}29$

$n=10 \quad \bar{i}_G = 1{,}91 - 1{,}258j \Rightarrow i_G = 2{,}287$

año 10 para el generador