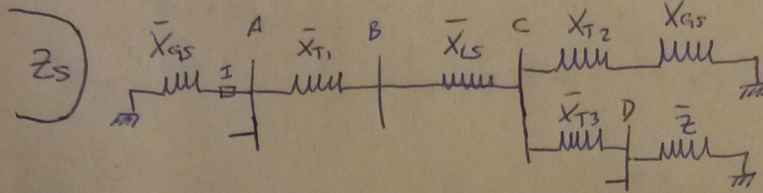
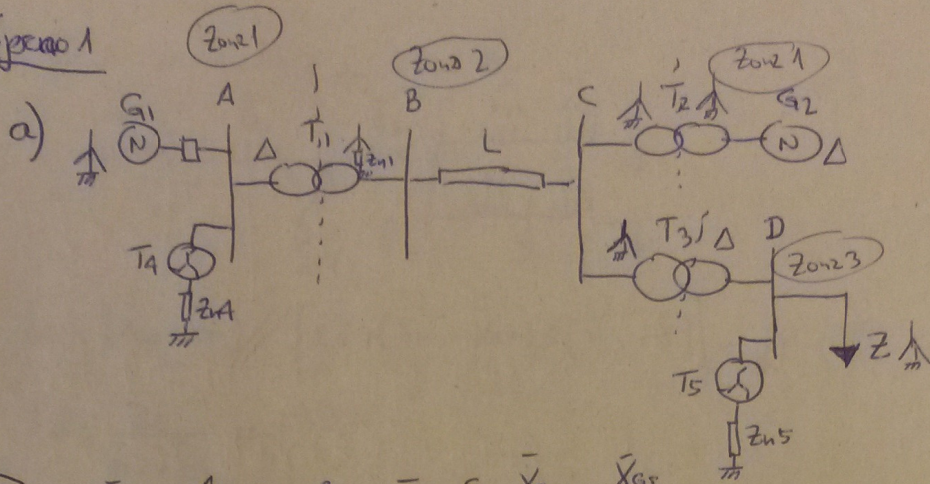
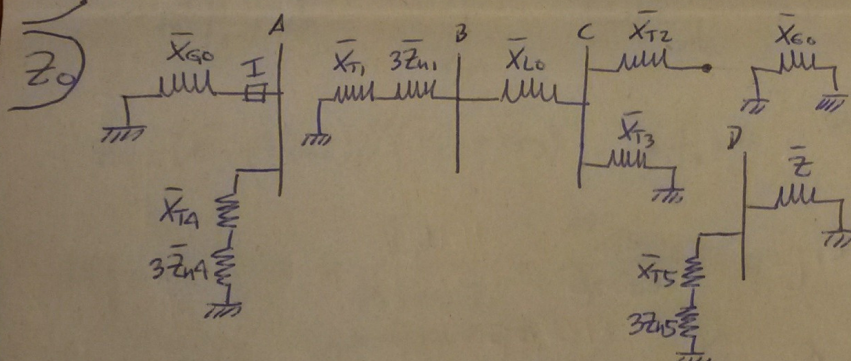


Ejercicio 1



Z2) es idéntica y 2 que los generadores tienen  $X_s = X_d$



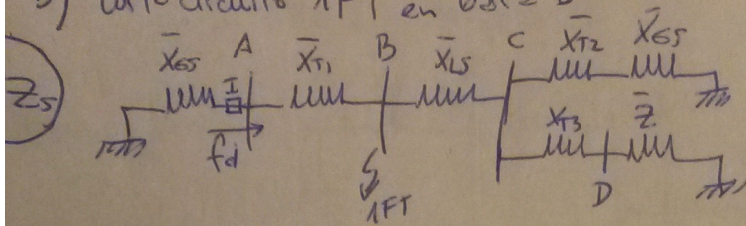
trabajo en P.V.

$U_{b1} = 15 \text{ kV}$   
 $U_{b2} = 150 \text{ kV}$   
 $U_{b3} = 60 \text{ kV}$   
 $S_b = 50 \text{ MVA}$   
 $Z_{b1} = \frac{U_{b1}^2}{S_b} = 4,5 \Omega$   
 $Z_{b2} = \frac{U_{b2}^2}{S_b} = 450 \Omega$   
 $Z_{b3} = \frac{U_{b3}^2}{S_b} = 72 \Omega$

$\Rightarrow$   
 e)  $X_{G1} = j0,02$     $X_{G2} = j0,1$   
 $T_{1,2})$   $X_{T1} = X_{T2} = j0,03$   
 $T_3)$   $X_{T3} = j0,06 \cdot \frac{50}{100} = j0,03$   
 $T_4)$   $X_{T4} = \frac{j1}{Z_{b1}} = j0,2222$   
 $T_5)$   $X_{T5} = \frac{j1}{Z_{b3}} = j0,0139$

l)  $X_s = \frac{j1}{Z_{b2}} = j0,0022$   
 $X_L = \frac{j2}{Z_{b2}} = j0,0044$   
 z)  $Z = j \frac{720}{Z_{b3}} = j10$   
 Neutros)  $Z_{n1} = \frac{j1}{Z_{b2}} = j0,0022$   
 $Z_{n4} = \frac{j1}{Z_{b1}} = j0,2222$   
 $Z_{n5} = \frac{j1}{Z_{b3}} = j0,0139$

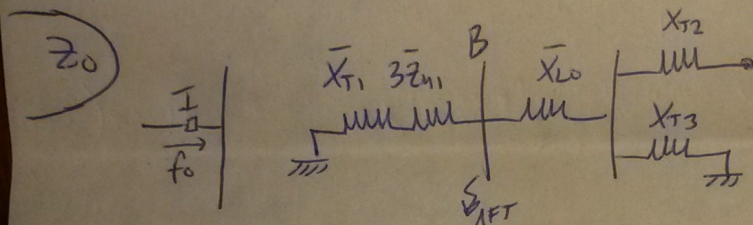
b) Cortocircuito 1FT en bus 2 B



$$\bar{Z}_s = (\bar{X}_{es} + \bar{X}_{Ti}) // [\bar{X}_{LS} + (\bar{X}_{T2} + \bar{X}_{es}) // (\bar{X}_{T3} + \bar{Z})] = j0,0255$$

$$\bar{I}_d = \frac{\bar{Z}_s}{\bar{X}_{es} + \bar{X}_{Ti}} = 0,5047$$

$$\bar{Z}_a = \bar{Z}_s \rightarrow f_a = -f_d \text{ por pasar por un } \Delta/\Delta$$



$$Z_0 = (\bar{X}_{Ti} + 3\bar{Z}_{n1}) // (\bar{X}_{Lo} + \bar{X}_{T3}) \rightarrow f_0 = \emptyset. \quad \bar{Z}_0 = j0,0178$$

$$1FT \Rightarrow \bar{I}'_{f2} = \frac{\bar{V}_{2d}}{\bar{Z}_s + \bar{Z}_a + \bar{Z}_0} = \frac{156/150}{0,0688} = -j15,13$$

$$\begin{cases} \bar{I}'_d = \bar{I}_d \bar{I}'_{f2} = -j7,713 \\ \bar{I}'_c = \bar{I}_c \bar{I}'_{f2} = +j7,713 \\ \bar{I}'_h = \bar{I}_h \bar{I}'_{f2} = 0 \end{cases}$$

$$\text{fases} \rightarrow \begin{cases} \bar{I}_1 = 0 \\ \bar{I}_2 = -13,36 \\ \bar{I}_3 = 13,36 \end{cases}$$

$$\bar{I}_{b1} = \frac{S_b}{\sqrt{3} U_{b1}}$$

$$I_{b1} = 1925 \text{ A}$$

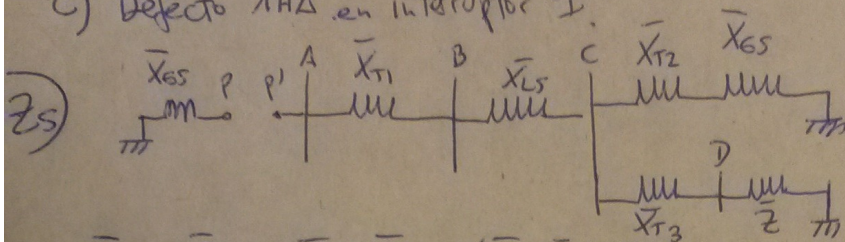
tomamos modulos

$$\Rightarrow \begin{cases} I_1 = 0 \\ I_2 = 25768 \text{ A} \\ I_3 = 25768 \text{ A} \end{cases}$$

Ej 1 (cont)

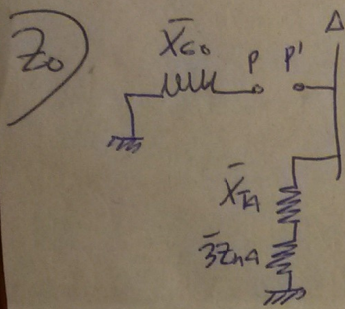
3/3

c) Defecto 1HA en interruptor I.



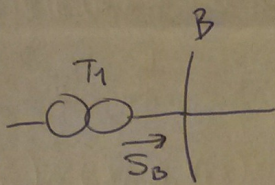
$$\bar{Z}_s = \bar{X}_{cs} + \bar{X}_{T1} + \bar{X}_{L5} + (\bar{X}_{T2} + \bar{X}_{cs}) // (\bar{X}_{T3} + \bar{Z}) = j0,102$$

$$\bar{Z}_a = \bar{Z}_s$$



$$\bar{Z}_0 = \bar{X}_{co} + \bar{X}_{T4} + 3\bar{Z}_{Fa} = j0,989$$

Previa al defecto



$|\bar{S}_B| = 50 \text{ MVA}$  como solo hay reactancias

$$\bar{S}_B = j 50 \text{ MVA} \Rightarrow \bar{S}_B = j \frac{50}{S_{base}} = 1j$$

$$\bar{I}_B = \frac{\bar{S}_B}{\bar{U}_B} = \frac{j1}{1,04} = -j0,9615$$

x Iden y Tomo Modulos

$$\Rightarrow \bar{U}_{pp'} = \bar{Z}_s \bar{I}_{fd} = 0,09981$$

$$\bar{I}_d = \frac{(z_a + z_0) U_{pp'}}{(z_s z_a + z_0 z_a + z_0 z_s)} = j0,5043$$

$$\bar{I}_i = \frac{(-z_0) U_{pp'}}{(z_s z_a + z_0 z_a + z_0 z_s)} = +j0,4572$$

$$\bar{I}_h = \frac{(-z_a) U_{pp'}}{(z_s z_a + z_0 z_a + z_0 z_s)} = +j0,0471$$

$$\begin{cases} i_1 = 0 \\ i_2 = 0,9327 + j0,0207 \\ i_3 = 0,9327 + j0,0207 \end{cases} \Rightarrow \begin{cases} I_1 = 0 \\ I_2 = 1608 \\ I_3 = 1608 \end{cases}$$