

~~Trabajo~~ Trabajo a Nivel 13,8 kV

$$\bar{U}_p = 155 \cdot \frac{13,8}{150} = 14260 \text{ kV}$$

Generador

$$\bar{x}_{gs} = 0,15j \cdot \frac{13,8^2}{50} = 0,5713j$$

$$\bar{x}_{ga} = \bar{x}_{gs}$$

$$\bar{x}_{gp} = 0,06j \cdot \frac{13,8^2}{50} = 0,2285j$$



Tramos

$$\bar{x}_{ps} = 0,07j \cdot \frac{13,8^2}{50} = 0,2667j (\Omega) \quad \bar{x}_p = 0,2285j (\Omega)$$

$$\bar{x}_{pt} = 0,15j \cdot \frac{13,8^2}{50} = 0,5713j (\Omega) \quad \bar{x}_s = 0,0381j (\Omega)$$

$$\bar{x}_{st} = 0,1j \cdot \frac{13,8^2}{50} = 0,3809j (\Omega) \quad \bar{x}_t = 0,3428j (\Omega)$$

Condensadores

$$\bar{z}_c = \frac{1}{2j \cdot \pi \cdot 50 \cdot 0,5 \times 10^{-3}} = -6,366j (\Omega)$$

Línea:

$$\bar{z}_{ls} = 0,85j \cdot \left(\frac{13,8}{150}\right)^2 = 0,0072j (\Omega)$$

$$\bar{z}_{lt} = 2j \cdot \left(\frac{13,8}{150}\right)^2 = 0,0169j (\Omega)$$

Reactancia Neutral

$$\bar{x} = 1j (\Omega)$$

Carga:

$$40j \cdot \left(\frac{13,8}{60}\right)^2 = 2,116j (\Omega)$$

Corrientes antes del defecto

$$\bar{I}_{obj} = \frac{U_p / \sqrt{3}}{\left[\bar{z}_{ls} + \bar{x}_p + (\bar{x}_s + \bar{z}) \parallel (\bar{x}_t + \bar{z}_c) \right]} = -2294j \text{ (A)}$$

$$\bar{I}_{abc} = \bar{I}_{obj} \cdot \frac{(\bar{x}_s + \bar{z})}{(\bar{x}_{st} + \bar{z} + \bar{z}_c)} = 1277j \text{ (A)}$$

Tensiones previas

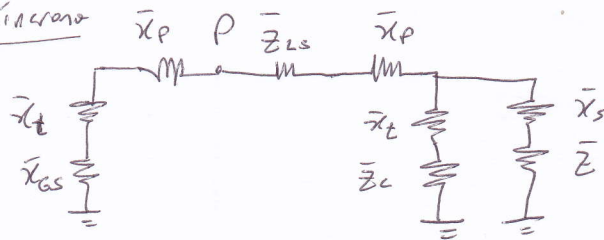
$$\bar{V}_{obj} = \bar{I}_{obj} \cdot \left[\bar{x}_{pc} + \bar{z}_{ls} + \bar{x}_p + (\bar{x}_s + \bar{z}) \parallel (\bar{x}_t + \bar{z}_c) \right] = 9544 \text{ (V)}$$

$$\bar{V}_{abc} = \bar{I}_{abc} \cdot \bar{z}_c = 8130 \text{ (V)}$$

Trabajo a nivel 150 kV

Redes de secuencia síncrona y asíncrona

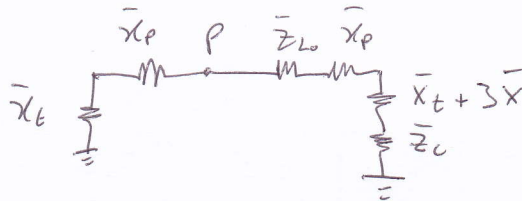
~~Redes de secuencia~~ $\bar{Z}_s = \bar{Z}_a$



$$\bar{Z}_s = \bar{Z}_a = (X_{pt} + X_{cs}) \parallel \left[\bar{X}_p + \bar{Z}_{ls} + (X_t + Z_c) \parallel (\bar{X}_s + \bar{Z}) \right] = 0,8667j \text{ (}\Omega\text{)}$$

$$f_{dg} = \frac{\bar{Z}_s}{X_{cs} + \bar{X}_{pt}} = 0,7588 ; \quad f_{dc} = \frac{(1-f_{dg}) \cdot [(X_t + Z_c) \parallel (\bar{Z} + \bar{X}_s)]}{X_t + \bar{Z}_c} = -0,1344$$

Red de secuencia cero



$$\bar{Z}_0 = (X_{pt}) \parallel (\bar{Z}_{l0} + \bar{X}_{pt} + 3\bar{X} + \bar{Z}_c) = 0,7192j \text{ (}\Omega\text{)}$$

$$f_{ng} = 0 ; \quad f_{nc} = \frac{\bar{Z}_0}{\bar{Z}_{l0} + X_{pt} + 3\bar{X} + \bar{Z}_c} = -0,2589$$

CC 1 FT

$$\bar{I}_d = \bar{I}_i = \bar{I}_n = \frac{\bar{U}_p / \sqrt{3}}{\bar{Z}_s + \bar{Z}_a + \bar{Z}_0} = -3357j \text{ (A)}$$

Por G : $\bar{I}_{dg} = \bar{I}_d \times f_{dg} + \bar{I}_{odg} = -4840j \text{ (A)}$; Por C : sentido de neutro hacia P

$\bar{I}_{ig} = -\bar{I}_i \times f_{dg} = 2546j \text{ (A)}$; $\bar{I}_{dc} = \bar{I}_d \cdot f_{dc} - \bar{I}_{odc} = -8258j \text{ (A)}$

$\bar{I}_{ng} = 0$; $\bar{I}_{ic} = \bar{I}_i \cdot f_{dc} = 4513j \text{ (A)}$

$\bar{I}_{nc} = \bar{I}_n \cdot f_{nc} = 869,1 \text{ (A)}$

Tensión en G : $\bar{U}_{dg} = -\bar{I}_d \cdot f_{dg} \cdot \bar{X}_{cs} + \bar{U}_{odg} = 8089 \text{ (V)}$

$\bar{U}_{ig} = \bar{I}_i \cdot f_{ig} \cdot \bar{X}_{ca} = 1455 \text{ (V)}$

$\bar{U}_{ng} = 0$

Tensión en C :

$\bar{U}_{dc} = -\bar{I}_d \cdot f_{dc} \cdot \bar{Z}_c + \bar{U}_{odc} = 5257 \text{ (V)}$

$\bar{U}_{ic} = -\bar{I}_i \cdot f_{ic} \cdot \bar{Z}_c = -2843 \text{ (V)}$

$\bar{U}_{nc} = -\bar{I}_n \cdot f_{nc} \cdot \bar{Z}_c = -5533 \text{ (V)}$

$\bar{S}_G = 3 \cdot \bar{U}_{dg} \cdot \hat{I}_{dg} + 3 \bar{U}_{ig} \cdot \hat{I}_{ig} = 106,3 \text{ MVA}$

$\bar{S}_C = 3 \cdot \bar{U}_{dc} \cdot \hat{I}_{dc} + 3 \bar{U}_{ic} \cdot \hat{I}_{ic} + 3 \bar{U}_{nc} \cdot \hat{I}_{nc} = 31,34 \text{ MVA}$