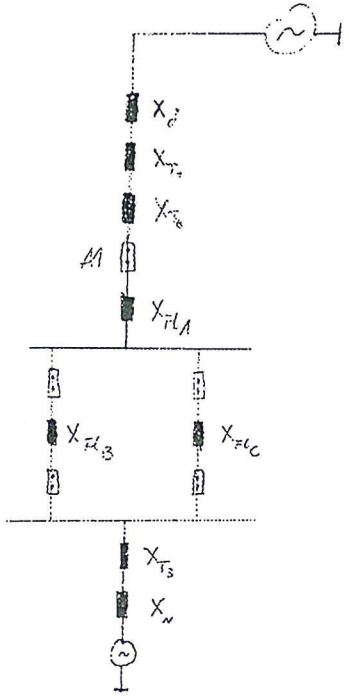
1. Aufgabe



$w.L. = 0{,}29 \frac{\Omega}{km}$

a) $X_{FL_A} = 60\,km \cdot 0{,}29 \frac{\Omega}{km} = 17{,}4\,\Omega$

$X_{FL_B} = 400\,km \cdot 0{,}29 \frac{\Omega}{km} = 116\,\Omega$

$X_{FL_C} = 400\,km \cdot 0{,}29 \frac{\Omega}{km} = 116\,\Omega$

$X_d = \frac{1{,}11\,(220\,kV)^2}{1000\,MVA} = 53{,}7\,\Omega$

$X_{T_2} = \frac{0{,}08\,(220\,kV)^2}{270\,MVA} = 19{,}6\,\Omega$

$X_{T_1} = \frac{0{,}12 \cdot (220\,kV)^2}{340\,kV} = 18{,}7\,\Omega$

$X_{T_3} = \frac{0{,}12\,(220\,kV)^2}{340\,kV} = 24{,}2\,\Omega$

$X_N = ?\,\Omega$

b) $X_{ges} = X_d + X_{T_1} + X_{T_2} = 53{,}7\,\Omega + 18{,}7\,\Omega + 19{,}6\,\Omega$

$= 92\,\Omega$

$S_{A1} = \frac{U_B^2}{X_{ges}} = \frac{(220\,kV)^2}{92\,\Omega} = 526{,}1\,MVA$

c) $X_{ges} = X_d + X_{T_1} + X_{T_2} + X_{FL_A} = \underbrace{X_{FL_B} \parallel X_{FL_C}}_{= \frac{1}{2} X_{FL_B} = \frac{1}{2} X_{FL_C}}$

$= 109{,}4\,\Omega + \frac{1}{2} \cdot 116\,\Omega$

$= 167{,}4\,\Omega$

$I_{2W} = \frac{220\,kV}{\sqrt{3}\,167{,}4\,\Omega} = 758{,}8\,A$

$I_{C1} = \frac{1}{2} I_{ges} = 379{,}4\,A$

$S_{C1} = \sqrt{3} \cdot 220\,kV \cdot 379{,}4\,A = 144{,}58\,MVA$