5.1.57. feladat

$q = 2$

$y_h = 5$

5.2.1. feladat

a) $I_s = \dfrac{P_s}{U \cdot \cos\varphi_s} = \dfrac{1400}{220 \cdot 0{,}8} = 7{,}95\ \text{A}$

$I_s = 7{,}95$ A

b) $Z_s = \dfrac{U}{I_s} = \dfrac{220}{7{,}95} = 27{,}67\ \Omega$

$Z_s = 27{,}67\ \Omega$

$R_s = Z_s \cdot \cos\varphi_s = 27{,}67 \cdot 0{,}8 = 22{,}14\ \Omega$

$R_s = 22{,}14\ \Omega$

$X_s = Z_s \cdot \sin\varphi_s = 27{,}67 \cdot 0{,}6 = 16{,}60\ \Omega$

$X_s = 16{,}60\ \Omega$

$\varphi_s = 36{,}86°$

c) $X_c = \dfrac{1}{\omega \cdot C} = \dfrac{10^6}{314 \cdot 30} = 106{,}16\ \Omega$

$X_c = 106{,}16\ \Omega$

d) $Z_s = \sqrt{R_s^2 + (X_c - X_s)^2} = (22{,}14)^2 + (106{,}16 - 16{,}60)^2 \approx 92{,}25\ \Omega$

$I_s = \dfrac{U}{Z_s} = \dfrac{220}{92{,}25} \approx 2{,}38\ \text{A}$

$I_s = 2{,}38$ A

$\cos\varphi_{s'} = \dfrac{R_s}{Z_{s'}} = \dfrac{22{,}14}{92{,}25} = 0{,}24$

$\cos\varphi_{s'} = 0{,}24$

$\varphi_{s'} = 76{,}12°$

e) $I_{cp} = \dfrac{U}{X_c} = \dfrac{220}{106{,}16} = 2{,}07\ \text{A}$

$\Delta I_c = I_s - I_{cp} = 2{,}38 - 2{,}07 = 0{,}31\ \text{A}$

$\Delta I_c = 0{,}31$ A

Az árama 0,31 A-rel csökken.

5.2.2. feladat

a) A főfázis fázisszöge:

$\cos\varphi_f = \dfrac{R_f}{Z_f} = \dfrac{30}{40} = 0{,}75$

$\cos\varphi_f = 0{,}75°$

$\varphi_f = \arccos\varphi_f = 41{,}4°$

$\varphi_f = 41{,}4°$

b) A főfázis árama:

$I_f = \dfrac{U}{Z_f} = \dfrac{220}{40} = 5{,}5\ \text{A}$

$I_f = 5{,}5$ A

c) A segédfázis teljesítménytényezője:

$\varphi_s' = 90° - \varphi_f = 48{,}6° \qquad \cos\varphi_s' = 0{,}66$

$\cos\varphi_s' = 0{,}66$