



$$I_{N, \text{grs}} = \frac{U_N}{\sqrt{3} \cdot (X_d + X_{T1} + X_{T2} + \frac{1}{3} X_{T2})} = \frac{220 \text{ kV}}{\sqrt{3} \cdot 135.10 \Omega} = 340.17 \text{ A}$$

$$I_{N, \text{LC1}} = I_{N, \text{grs}} \cdot \frac{\frac{1}{3} X_{T2}}{\frac{1}{3} X_{T2} + \frac{1}{3} X_{T2}} = 340.17 \text{ A} \cdot \frac{2}{3} = 626.78 \text{ A}$$

$$I_{N, \text{LC2}} = I_{N, \text{grs}} - I_{N, \text{LC1}} = 340.17 \text{ A} - 626.78 \text{ A} = 313.39 \text{ A}$$

$$I_{N, \text{grs}} = \frac{U_N}{\sqrt{3} \cdot (X_{T2} + X_N + \frac{1}{3} X_{T2})} = \frac{220 \text{ kV}}{\sqrt{3} \cdot (41.08 \Omega)} = 3092.02 \text{ A}$$

$$I_{N, \text{LC2}} = I_{N, \text{grs}} \cdot \frac{\frac{1}{3} X_{T2}}{\frac{1}{3} X_{T2} + \frac{1}{3} X_{T2}} = 3092.02 \text{ A} \cdot \frac{2}{3} = 1061.35 \text{ A}$$

$$I_{N, \text{LC1}} = I_{N, \text{grs}} - I_{N, \text{LC2}} = 3092.02 \text{ A} - 1061.35 \text{ A} = 2030.67 \text{ A}$$

$$I_{C1, \text{grs}} = I_{N, \text{LC1}} + I_{N, \text{LC2}} = 626.78 \text{ A} + 1030.67 \text{ A} = 1657.45 \text{ A}$$

$$I_{C2, \text{grs}} = I_{N, \text{LC2}} + I_{N, \text{LC1}} = 313.39 \text{ A} + 2061.35 \text{ A} = 2374.74 \text{ A}$$

$$S_{C1, \text{grs}} = \sqrt{3} \cdot U_N \cdot I_{C1, \text{grs}} = \sqrt{3} \cdot 220 \text{ kV} \cdot 1657.45 \text{ A} = 631.57 \text{ MVA}$$

$$S_{C2, \text{grs}} = \sqrt{3} \cdot U_N \cdot I_{C2, \text{grs}} = \sqrt{3} \cdot 220 \text{ kV} \cdot 2374.74 \text{ A} = 904.9 \text{ MVA}$$

d)

$$I_S = 2 \cdot \sqrt{2} \cdot I_N$$

$$I_{S, \text{grs}} = \frac{U_N}{\sqrt{3} \cdot (X_d + X_N + X_{T2} + \frac{1}{3} X_{T2})}$$

$$= \frac{220 \text{ kV}}{\sqrt{3} \cdot 135.10 \Omega} = 340.17 \text{ A}$$

$$I_{S, \text{LC1}} = \frac{U_N}{\sqrt{3} \cdot (X_{T2} + X_N)} = \frac{220 \text{ kV}}{\sqrt{3} \cdot 11.08 \Omega}$$

$$= 11463.63 \text{ A}$$

$$\Rightarrow I_{N, \text{grs}} = I_{S, \text{LC1}} + I_{S, \text{LC2}} = 340.17 \text{ A} + 11463.63 \text{ A}$$

$$= 12403.8 \text{ A}$$

$$I_{S, \text{grs}} = 2 \cdot \sqrt{2} \cdot 12403.8 \text{ A} = 35083.24 \text{ A}$$