



$$I_T^* = \frac{P_1 + jQ_1}{V_A} = \frac{0.5 + j0.4}{1} = 0.5 + j0.4 = 0.64 \angle 36.87^\circ$$

$$I_T = 0.64 - j0.5 = 0.83 \angle -36.87^\circ$$

$$V_B = V_A - Z_{T1} I_T = 1 - j0.05(0.64 - j0.5) = 0.994 - j0.08$$

$$V_B = 0.994 \angle 4.18^\circ$$

$$(P_4 + jQ_4) + (P_3 + jQ_3) = P_2 + jQ_2$$

$$P_2 + jQ_2 = P_1 + jQ_1 - Z_{T1} |I_T|^2 = (0.5 + j0.4) - j0.05 \times 0.64^2 = 0.5 + j0.4$$

$$P_4 + jQ_4 = 0.9 - j0.4$$

$$jQ_5 = j \frac{b}{2} |V_B|^2 = j0.012 \times (0.994)^2 = j0.0116$$

$$P_2 + jQ_2 = P_4 + jQ_4 - jQ_5 = 0.9 - j0.4116$$

$$I_{Bc}^* = \frac{P_2 - jQ_2}{V_B} = \frac{0.991 - j0.4116}{0.994 \angle 4.18^\circ}$$

$$I_{Bc} = 1.053 \angle 126.4^\circ = 0.995 + j0.354$$

$$P_3 + jQ_3 = P_2 + jQ_2 + 2L |I_{Bc}|^2 = 0.9955 - j0.28$$

$$V_C = V_B + Z_{T2} I_{Bc} = (0.994 - j0.08) + (0.05 + j0.05)(0.995 + j0.354)$$

$$V_C = 0.995 \angle 2.34^\circ$$

$$jQ_8 = j \frac{b}{2} |V_C|^2 = j0.012 (0.995)^2 = j0.0118$$

$$P_3 + jQ_3 = P_7 + jQ_7 - jQ_8 = 0.9955 - j0.29$$

$$P_3 + jQ_3 = P_9 + jQ_9 + 0.5 + j0.14 = 1.4955 + j0.14$$

$$P_{G2} = 145 \text{ MW}$$

$$Q_{G2} = 11 \text{ MVAR}$$