

TPO CALCULATION

$$\text{ERP (dBk)} = \text{TPO (dBk)} + \text{Antenna Gain (dBd)} - \text{Line Loss (dB)}$$

$$\begin{aligned}\text{ERP (kW)} &= 7 \text{ kW} \\ \text{ERP (dBk)} &= 8.45 \text{ dBk}\end{aligned}$$

$$\begin{aligned}\text{Antenna Gain} &= 4.144 \\ \text{Antenna Gain (dBd)} &= 10 \cdot \log(4.144) = 6.17 \text{ dBk}\end{aligned}$$

$$\begin{aligned}\text{Line Loss} &= 1.11 \text{ dB/100 meters} \\ \text{Line Length} &= 80 \text{ feet (24.4 meters)} \\ \text{Total Line Loss} &= 1.11 \text{ dB/100 meters} \cdot 24.4 \text{ meters} = 0.27 \text{ dB}\end{aligned}$$

$$\text{TPO (dBk)} = \text{ERP (dBk)} - \text{Antenna Gain (dBd)} + \text{Line Loss (dB)}$$

$$\text{TPO (dBk)} = 8.45 - 6.17 + 0.27 = 2.55 \text{ dBk}$$

$$\text{TPO (kW)} = 10^{(2.55/10)} = \underline{\underline{1.80 \text{ kW}}}$$