70. (a) The rms current in the cable is $I_{\text{rms}} = P/V_t = 250 \times 10^3\,\text{W}/(80 \times 10^3\,\text{V}) = 3.125\,\text{A}$. The rms voltage drop is then $\Delta V = I_{\text{rms}} R = (3.125\,\text{A})(2)(0.30\,\Omega) = 1.9\,\text{V}$, and the rate of energy dissipation is $P_d = I_{\text{rms}}^2 R = (3.125\,\text{A})(2)(0.60\,\Omega) = 5.9\,\text{W}$.

(b) Now $I_{\text{rms}} = 250 \times 10^3\,\text{W}/(8.0 \times 10^3\,\text{V}) = 31.25\,\text{A}$, so $\Delta V = (31.25\,\text{A})(0.60\,\Omega) = 19\,\text{V}$ and $P_d = (3.125\,\text{A})^2(0.60\,\Omega) = 5.9 \times 10^2\,\text{W}$.

(c) Now $I_{\text{rms}} = 250 \times 10^3\,\text{W}/(0.80 \times 10^3\,\text{V}) = 312.5\,\text{A}$, so $\Delta V = (312.5\,\text{A})(0.60\,\Omega) = 1.9 \times 10^2\,\text{V}$ and $P_d = (312.5\,\text{A})^2(0.60\,\Omega) = 5.9 \times 10^4\,\text{W}$. Both the rate of energy dissipation and the voltage drop increase as V_t decreases. Therefore, to minimize these effects the best choice among the three V_t's above is $V_t = 80\,\text{kV}$.