P # 59

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$r = 200\ m$

$n = 100$ coils

$I_1 = 6.02 \times 10^6\ A$
$I_2 = \text{zero}$

$t = 10.5\ \mu s = 10.5 \times 10^{-6}\ sec$

Find B_1: $\quad B_1 = \dfrac{\mu_0 \cdot I_1}{2\pi r} = \dfrac{(4\pi \times 10^{-7}\ T\cdot m/A)(6.02 \times 10^6\ A)}{2\pi \cdot (200\ m)}$

$$B_1 = .00602\ T$$

Find $\Delta\phi$: $\quad \phi_1 = B \cdot A = B \cdot (\pi r^2)$

$$= (.00602\ T)(\pi \cdot 80 m^2)$$

$$\phi_1 = .012\ T\cdot m^2$$

$$\phi_2 = \text{zero}$$

Find $\mathcal{E}$: $\quad \mathcal{E} = n \cdot \dfrac{\Delta\phi}{\Delta t}$

$$= (100\ \text{coils}) \cdot \frac{(.012\ T\cdot m^2 - 0)}{(10.5 \times 10^{-6}\ sec)}$$

$$\boxed{\mathcal{E} = 115{,}300\ V}$$