

24. We recall Eq. 44-6:  $Q \approx 200 \text{ MeV} = 3.2 \times 10^{-11} \text{ J}$ . It is important to bear in mind that Watts multiplied by seconds give Joules. From  $E = Pt_{\text{gen}} = NQ$  we get the number of free neutrons:

$$N = \frac{Pt_{\text{gen}}}{Q} = \frac{(500 \times 10^6 \text{ W})(1.0 \times 10^{-3} \text{ s})}{3.2 \times 10^{-11} \text{ J}} = 1.6 \times 10^{16} .$$