15. If P is the power output, then the energy E produced in the time interval Δt $(= 3\,\mathrm{y})$ is $E = P\,\Delta t = (200 \times 10^6\,\mathrm{W})(3\,\mathrm{y})(3.156 \times 10^7\,\mathrm{s/y}) = 1.89 \times 10^{16}\,\mathrm{J}$, or $(1.89 \times 10^{16}\,\mathrm{J})/(1.60 \times 10^{-19}\,\mathrm{J/eV}) = 1.18 \times 10^{35}\,\mathrm{eV} = 1.18 \times 10^{29}\,\mathrm{MeV}$. At 200 MeV per event, this means $(1.18 \times 10^{29})/200 = 5.90 \times 10^{26}$ fission events occurred. This must be half the number of fissionable nuclei originally available. Thus, there were $2(5.90 \times 10^{26}) = 1.18 \times 10^{27}$ nuclei. The mass of a $^{235}\mathrm{U}$ nucleus is $(235\,\mathrm{u})(1.661 \times 10^{-27}\,\mathrm{kg/u}) = 3.90 \times 10^{-25}\,\mathrm{kg}$, so the total mass of $^{235}\mathrm{U}$ originally present was $(1.18 \times 10^{27})(3.90 \times 10^{-25}\,\mathrm{kg}) = 462\,\mathrm{kg}$.