1. (Problem 1.7 in Attix) A point source, isotropically emitting $10^8$ fast neutrons (n°) per second, falls out of its shield onto a railroad platform, 3 meters (horizontally) from the track. A train goes by at 60 mi h$^{-1}$. Ignoring scatter and attenuation, what is the fluence of neutrons that would strike a passenger at the same height above the track as the source?

2. Show that absorbed dose has the same units as velocity squared. What, if anything, does this imply about the relation of dose to velocity?

3. (Problem 1-5 in Attix) A point source of $^{60}$Co emits equal numbers of photons of 1.17 and 1.33 MeV giving a flux density (ICRU #60 calls it “fluence rate”) of $5.7 \times 10^9$ photon cm$^{-2}$ s$^{-1}$ at a specified location. What is the energy flux density (ICRU #60 now calls it “energy fluence rate”) expressed in MeV cm$^{-2}$ s$^{-1}$ and in J m$^{-2}$ min$^{-1}$?

4. (Problem 1-8 in Attix) An x-ray field at a point P contains $7.5 \times 10^8$ m$^{-2}$ s$^{-1}$ keV$^{-1}$, uniformly distributed from 10 to 100 keV. (We might symbolize this, using ICRU#60 notation, as $\Phi = \int \frac{d\Phi}{dE} \frac{dE}{dt} = \frac{d}{dt} \left( \frac{d}{dE} \left( \frac{dN}{da} \right) \right)$).

   a. What is the photon fluence rate at P?
   b. What would be the photon fluence in one hour?
   c. What is the corresponding energy fluence in J m$^{-2}$?