NUCL 40200 Engineering of Nuclear Power Systems

Assignment 4

(1) Using the equation for the reactivity equivalent of the Xe135, plot the reactivity buildup after shutdown in 235U fueled reactor for four values of the flux prior to shut down: 2.0E+14, 4.0E+14, 6.0E+14, and 8.0E+14. Use appropriate values for all parameters required in the equation.

(2) If the maximum reserve reactivity is 0.2, then obtain the "reactor dead time" for each of these four reactor fluxes from the plot of reactivity after shutdown done in problem (1), and then plot the "reactor dead time" as function of reactor flux.

(3) (a) First calculate the dose rate (rem/hr), at 1.5 m from a source containing 1.5 Ci of I-131 that emits three gamma rays. (b) Then plot the dose rate as a function of distance ranging from 1 m to 5m from this source