

**Assignment 10**  
Due 11/09/2021

*Short Answer Problems*

1. Explain the importance of having correct kinetics values input into RELAP. (Do not just say an error will occur)

*Application Problem 1*

Create a separable point kinetics input in a RELAP5-3D input file with the below information:

- Use fission product decay plus actinide decay calculations
- A reactor with a total power of 1200 MW
- Initial reactivity is 0.0
- Delayed neutron fraction is 0.0056
- Prompt Neutron lifetime is 0.025ms
- Use ANS79-1 Fission product type
- Input the power history as shown in Table 1
- You do not need to input weighting factors
- Create a density feedback table from a density of 3lb/ft<sup>3</sup> to 60lb/ft<sup>3</sup>
  - o Reactivity (%) =  $42.056 * \ln(\text{density}(\text{lb}/\text{ft}^3)) - 162.88$
- Create a doppler reactivity table from a temperature of 300°F to 6000°F
  - o Reactivity (%) =  $(-0.0000176^\circ\text{F}^{-1}) * (\Delta T)$
- All other values can be left at default or just use a reasonable guess

You only need to create the kinetics input, not a full input deck. Please remember to comment all lines and keep close track of any calculations that are preformed.