Assignment 6
Due 10/17/2023

Short Answer Problems

1. Explain the difference between the semi-implicit and nearly implicit solution strategies. Explain how to specify which strategy will be used in an input deck.

2. What is Verification and Validation and what role does it play in our work with RELAP5-3D

3. Explain the concept of Phenomena Identification and Ranking (PIRT)

4. Define the principle of Quality Assurance and name some of the requirements to have a QA program as defined by 10 CFR 50.

Application Problem 1

Part 1

Take the heat exchanger from Assignment 4 and the pump from Assignment 5 and combine them so as to have the pump provide fluid through the tubes of the heat exchanger. You may leave the shell fluid being pumped by a time dependent junction. Explain/show how the behavior of the flow through the tubes is different when using a pump vs. a time dependent junction [do this how you best see fit, but make your point clear (use plots, etc.)].

Part 2

Model a break on the outside of the shell (does not matter exact size or location but specify where you are placing the break.) Once the break occurs make sure you have some safety system to stop the hot fluid flowing through the tubes since there will no longer be cooling fluid in the shell. Show plots/data to explain what happened during this accident scenario.

Group Problem 1

Add Heat Structures to your model representing the core power and appropriate heat exchangers.