

CheEn 512 Project Description

Transient Run presentation & report

The purpose of this project is to give you a taste of nuclear reactor transient modeling. Though there is insufficient time and resources to provide a complete transient analysis, which includes uncertainty propagation and quantification, robust statistical analyses, and a complete validation of numbers, you will create an input deck for a given reactor and then run and analyze a single transient with that selected reactor. This is a group assignment, and there will be two deliverables: 1) a written report summarizing the reactor, the RELAP5-3D deck, the selected transient, and the results, and 2) an oral report via PowerPoint presentation that includes the same information. There is no length requirement for the report, it simply needs to contain all of the information and be written well. This report is due at the start of your assigned oral presentation slot. For the oral report, you will have only 20 minutes (+10 minutes for questions), and a significant penalty will be given for going overtime, so please do not go over 20 minutes! The following things must be included in both the report and presentation:

1. An overview of your selected reactor
2. A RELAP5-3D nodalization diagram which includes at least
 - a. The core
 - b. The primary heat exchanger
 - c. Pumps
 - d. Piping
 - e. Condenser (if applicable)
 - f. A secondary system boundary (or complete system, if needed)
 - g. Any applicable safety systems, such as decay heat removal HX, extra water, containment vessels, etc.
 - h. A break/trip initiating your transient
3. An explanation/justification of your input values (i.e. how did you come up with all the key parameters such as length, area, flow, power, etc.) that you used in your model
4. The steady state results for your reactor, including key state points
5. An overview of your selected transient, including:
 - a. What it is
 - b. Why it's a problem
 - c. Conditions of your transient, and an explanation why these were selected
 - d. List of which parameters you will be watching (fuel temp, coolant void fraction, etc)
6. The results of your transient

Note that when I say results, I want to see plots, tables, numbers, and descriptions of what has actually happened; i.e. you should be able to tell me step by step what happens to your reactor, and then use plots, numbers, charts, and RELAP5 output data to prove that what you are saying is accurate. Please see the following two pages for the grading rubric for both the written report and the oral report. Good luck!