NTEC Module N01: Reactor Physics, Design and Criticality

POST COURSE ASSESSMENT

• Project Outlines

You will be required to attempt ONE of the following:

1) Write a report explaining how aspects of reactor design, reactor physics, reactor operations etc. led to the most significant reactor accidents at Windscale, Three Mile Island, Chernobyl or Fukushima (or a combination of these). You could also consider the criticality accident at Tokai-mura in Japan; explaining the causes of the incident from both an operational and physics perspective.

2) Use a computer program (or Mathcad or even Excel) to do some simple reactor modelling. This could take the form of looking again at simple, homogeneous critical reactors, in which you vary things like system size, fuel enrichment, moderator properties etc. It could also (as well as, or instead of) involve looking at modelling the build up and decay of Iodine and Xenon in the reactor as a function of time, when the reactor is running, shut down and brought to power again (or when power level changes are made, e.g. as they did at Chernobyl). Write a report on your findings.

3) Write a report on how the various elements of Reactor Physics, Design and Criticality studied in the Birmingham module relate to your area of work (or anticipated area of work), including things we have studied, but also any other relevant factors that we did not have time to get onto during the one week.

• Guidelines

The only guidelines are the general NTEC guidelines for time to spend on post week projects, which is 70 hours of work (which includes time to write up the report).

If, rather than attempting just one of the above, you prefer to attempt more than one and break the report into smaller sections, you are equally welcome to do that.

The project is worth 50% of the overall module mark.

Enjoy your project!