NUCE 497I

Exam 2

(Based on Chapters 5 and 6)

1. **(15)** Please discuss the assumptions and deficiencies of the neutronics and burnup models (given in Equations 5.1 through 5.4 in Chapter 5) utilized in fuel performance calculations.

2. **(10)** Discuss the mechanisms behind the rim formation in fuel pellet and how it affects the power and burnup distribution at high burnups and subsequently fuel behavior.

3. **(15)** Describe the CRUD deposition and follow-up Axial Offset Anomaly (AOA) and how this affects the fuel performance.

4. **(10)** Please discuss how the Rod Ejection Accident (REA) in a PWR affects in principal the fuel and cladding behavior. What are the most important REA parameters determining the magnitude of these effects and corresponding consequences.

5. **(10)** Please discuss the consequences of PWR REA for fresh fuel and what safety limits are reasonable to use in this case.

6. **(10)** Please discuss the consequences of PWR REA for high-burnup fuel and what safety limits are reasonable to use in this case.

7. **(10)** Please discuss how the Loss Of Coolant Accident (LOCA) in a PWR affects in principal the fuel and cladding behavior. What are the most important LOCA parameters determining the magnitude of these effects and corresponding consequences.

8. **(10)** Please discuss the consequences of PWR LOCA for fresh fuel and what safety limits are reasonable to use in this case.

9. **(10)** Please discuss the consequences of PWR LOCA for high-burnup fuel and what safety limits are reasonable to use in this case.