NE585 – Nuclear fuel cycle analysis
Project 6a – Back end of the nuclear fuel cycle

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Total – 350

Acronyms

SMR Small Modular Reactor.

1 Reactivity & burnup

(100)

Derive an expression for $\rho_n(t)$ in terms of $B(T)$. See Appendix I for equations.

2 Reactivity swing

(50)

Show that the reactivity swing decreases with increasing batches.

3 Burnup limit

(50)

Find $\lim_{n\to\infty} \frac{B_n(T)}{B(T)}$.

4 Burnup & fuel management

(50)

What does this mean in terms of practical incore fuel management?

5 Small Modular Reactors

(50)

Are there special core loading considerations for NuScale?

6 Burn cycles

(50)

What is the relationship between SWU, extended burnup, and extended burn cycle?

Tables

Figures

Appendix I: Equations

$$\rho = \rho_0 - aB \tag{1}$$

$$\rho_2(t) = \frac{\rho_0}{2}[(1 - \frac{B_2^1(t)}{B(T)}) + (1 - \frac{B_2^2(t)}{B(T)})] \tag{2}$$

$$\rho_3(t) = \frac{\rho_0}{3}[(1 - \frac{B_3^1(t)}{B(T)}) + (1 - \frac{B_3^2(t)}{B(T)}) + (1 - \frac{B_3^3(t)}{B(T)})] \tag{3}$$