One

BASIC TOPICS AND NOMENCLATURE

1-1 Basic Time-Dependent Phenomena in Nuclear Reactors

* Time-dependent phenomena in nuclear reactors
  1. short time phenomena: milliseconds to seconds
  2. medium time phenomena: over hours or days
  3. long time phenomena: over several months or years

=> These time-dependent phenomena basically include changes in the neutron flux and the reactor systems.

* feedback
  : flux changes -> changes in the reactor -> "act back" on the flux

* Since short, medium, and long time phenomena are physically different phenomena resulting in different sets of equations, different concepts and solution approaches are utilized.

1-2 Kinetics Versus Dynamics

* dynamics vs. fuel cycle problems

dynamics	a few authors	all time-dependent phenomena
fuel cycle problems	most authors	long time phenomena to represent a separate category

* short time phenomena
  1. kinetics, for the entire class of short time phenomena
  2. dynamics, for the entire class of short time phenomena
  3. dynamics, as a general heading for the entire class of short time phenomena, with two subheadings:
     (a) kinetics, for short time phenomena without feedback
     (b) dynamics, in the narrower sense, for short time phenomena with feedback.
     => **used in this book**