AECL EACL

# RFSP Training Course
# (Course Agenda)

Benoit Arsenault, AECL

March 2000

# Course Agenda

- Introduction

  ↑ Methods of Physics Analysis and Physics Computer Codes

  ↑ Three-tier Scheme for CANDU Reactor-Physics Calculations

  ↑ Role of RFSP

  ↑ General Capabilities of RFSP

- The RFSP Direct-Access File

  ↑ *PRINT MASS

  ↑ *STORE

  ↑ *USE DAF/*MAKE DAF vs *READ TAPE/*RITE TAPE

# *Course Agenda*

- **RFSP Model**

  ↑**Neutron Diffusion Equation**

  ↑**Geometry**

  ↑**Lattice Properties**

  ↑**Reactivity Devices and Device Properties**

  ↑**Smearing of the Devices**

  ↑**Irradiation Distribution: 3 Models**

# *Course Agenda*

- **Time-Average Model**

  ↑**Irradiation Regions**

  ↑**Average vs. Spatially-Distributed Xenon Concentration**

  ↑**Perturbations**

  ↑**Flux Flattening**

  ↑**Time-Average Equivalence**

# *Course Agenda - Workshop Number 1*

- **Direct-Acess File**

- **Define Material Properties**

- **Generate Lattice Properties**

- **Definition of a Complete CANDU6 Model**

- **Time-Average Model**

- **Time-Average Equivalence**

- **Simulation of a fresh Core (0 n/kb no depleted fuel)**

# Course Agenda

- *CERBERUS
  - ↑Spatial Kinetics
  - ↑IQS Method
  - ↑General Scheme of Solution
  - ↑Examples
- *POWDERPUFS
  - ↑Theory, Westcott Convention
  - ↑Generation of Fuel Tables
  - ↑Interaction with Other Modules

# Course Agenda

- *SIMULATE

  ↑Snapshots

  ↑Average vs. Spatially-Distributed Xenon
  Concentration

  ↑Grid-Based Local-Parameter Methodology

  ↑History-Based Local-Parameter Methodology

- *INTREP

  ↑Detector Dynamics

  ↑Lead Cables

# Course Agenda - Workshop Number 2

- **Transfer from a Snapshot to a History-Based Simulation**

- **Calculation of the Phinoms for spatial Control**

- **Bulk and spatial Control**

- **Cerberus (The Static Case)**

- **Cerberus (The Adjoint Solution)**

- **Cerberus (Dynamic Analysis)**

# Course Agenda

- **Flux and Power Mapping**

    ↑**Theory**

    ↑**Applications to Core Tracking**

    ↑**Auxiliary Calculation Modules**

    ↑**Failed Detectors**

    ↑**Examples**

# Course Agenda - Workshop Number 3

- Definition of the detectors in *INTREP
- Generation of the modes
- Generation of the Fundamental Mode
- Flux Mapping Using the Data from the Off-Line System
- Powermap

# Course Agenda

- *CERBRRS

  ↑General Scheme of Solution

  ↑Examples

- *INSTANTAN

  ↑Theory

# Course Agenda - Workshop Number 4

- **Cerbrrs (Static Case)**
- **Cerbrrs (The Adjoint Solution)**
- **Cerbrrs (Dynamic Analysis)**
- **Trip Time**
- **Simulation of a refuelling**
- **Flux Mapping of a Refuelling Simulation**
- **Generation of a Refuelling Map with \*INSTANTAN**

# Course Agenda

- Code Development

  ↑Lattice Calculations

  ↑2-Group Properties

  ↑History-Based Simulations

- 2-Group Modules

- Software Support

# Course Agenda - Workshop Number 5

- **Review of the Previous Workshops**
- **Answer Questions**