Gen IV Reactor Physics Workshop: Introduction and Objectives

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Introduction

- Generation IV is an emerging international program
- Focus of GIF collaborations is to develop the Gen IV systems
- Steering committees formed in GIF for four systems
  - VHTR, SCWR, GFR, and SFR
    (formation of LFR committee underway)
  - System R&D plans being developed, based on Gen IV Roadmap
  - R&D for each system organized as “projects”
    - Design and safety
    - Materials
    - Fuels
  - “Common projects” of interest to multiple systems
    - Fuel cycle processes
    - Energy conversion technologies

Reactor Physics of Gen IV Systems

- Physics design is an integral part of design/safety projects
  - Highly relevant to other projects as well (fuels, fuel cycle, materials)

- Reactor physics capabilities not seen as a feasibility issue
- NGNP initiative in US is targeting a more aggressive development pace
  - Motivates improvement of tools and their validation status, to support design optimization and licensing

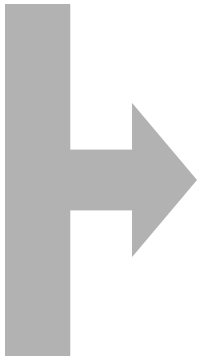
- Most reactor physics issues are system specific, e.g.,
  - Validation of VHTR CP fuel modeling
  - Pb, Bi data
- Some are common or crosscutting
  - Actinide data for fast reactors operated in closed fuel cycle
  - Modular or general purpose code systems
  - Improved Monte Carlo capabilities

Physics Activities in US Gen IV program

Measurements (Integral, Differential)

Analysis Capabilities (Data, Modeling)

Assess:
- **Completeness**
- **Quality**
- **Significance of gaps**



Required Improvements

Specific Activities underway in FY 2004*:
- **Identification, assessment and documentation of relevant integral benchmarks (VHTR/NGNP)**
- **Assessment and initial improvement of deterministic analysis capabilities for VHTR**
- **Participation in CEA experiments on GFR**

** Based in part on outcome of US Gen IV workshops held in FY 2003*

Workshop Objectives

- **Multi-national exchange of information on perspectives and efforts related to physics of Generation IV systems**
  - **Discuss priorities as currently perceived**

- **Identify topics of common interest**

- **Define opportunities and approaches for bi-lateral or multi-lateral cooperation**
  - **Sharing of datasets and computer codes**
  - **Joint analysis of benchmarks and inter-comparison of codes**
  - **Joint definition of required/desired advances (consider target accuracies)**
  - **Coordinated compilation and assessment of data (e.g., integral measurements)**
  - **Coordinated development of new models**
  - **Joint planning and execution of experiments on existing facilities**
  - **Joint definition of needs for new measurements (and supporting facilities?)**

- **Above may provide basis for recommendations to GIF Expert Group and SSC's**

Workshop Agenda

8:45 – 11:30	**Invited presentations on national perspectives (France, Japan, US, ROK, EC)**
11:30 – 1:00	**Lunch**
1:00 – 4:00	**Discussion sessions** **1. Methods and codes** **2. Nuclear Data**
4:00 – 5:00	**Wrap-up: conclusions and recommendations**