FHR Integrated Research Project (IRP-2) Workshop 2

FHR Benchmark Workshop

Neutronics Working Group Agenda
Clark Kerr Campus - Newell Perry Room
Berkeley, California
April 14-15, 2016

Neutronics: The focus of this working group is on developing a benchmark specification for code-to-code comparison of FHRs. Key outcomes are feedback on existing work, adding/removing results of interest, development of benchmark specification, code limitations and how the specification should be distributed.

Day 1: Thursday, April 14, 2016 (*Newell Perry Room***)**

Session 1

10:40 – 11:00 **Neutronics Scope Definition**
Facilitators: Dan Shen, Lance Maul

Welcome and overview of discussion structure and high level goals/outcomes.

11:00 – 12:00 **UCB FHR Neutronics Benchmark Specification Development**
Facilitators: Dan Shen, Lance Maul

The outcome of this benchmark is to identify and quantify any discrepancies that may arise from using a particular code to model FHR systems, focusing on k-eff, point kinetics, cross sections, reactivity coefficients, neutron flux & distributions, power distributions and potentially burnup. Discussion can include reviewing the results and methodology in the work so far and how it can be improved further.

12:00 – 1:15 **Lunch – All WGs**
Lunch Talk: SINAP TMSR program update

1:15 – 2:15 **Further Discussion on the UCB Benchmark Specification**
Facilitators: Dan Shen, Lance Maul

Continuing the discussion on the benchmark work from UCB.

2:15 – 2:30 **Break**

2:30 – 3:30 **Multiphysics models of FHRs**
Facilitators: Xin Wang, Dr. Manuele Aufiero

Present the UCB efforts in developing coupled thermal-hydraulics and neutronics models for pebble-bed FHR transient analysis. Discuss challenges, best practices and path forward.

3:30 – 3:45 **Break**

3:45 – 4:25 **Progress of Neutronics Design of TMR-SF1**
Facilitators: Dr. Yang Zou

4:25 – 5:00 **ORNL FHR Engineering Demonstration Reactor**
Facilitators: Dr. Nicholas Brown

Fluoride salt-cooled high-temperature reactors (FHRs) represent a potentially promising advanced reactor technology option. Significant knowledge gaps to implementation of FHRs may be addressed via a small-scale demonstration reactor to increase the technology readiness level (TRL) of the system. This talk outlines a notional concept for an FHR demonstration reactor and addresses how the demonstration reactor would advance the TRL of FHR concepts. Additionally, the talk includes a discussion of ad-hoc tool development accomplishments and future needs for salt reactor design and analysis. The FHR demonstration reactor point design is under development as part of a U.S. Department of Energy Office of Nuclear Energy study of options for advanced test and demonstration reactor systems.

The development of the FHR demonstration reactor point design concept is a collaborative and crosscutting team effort that spans multiple groups within the Reactor and Nuclear Systems Division. The FHR demonstration reactor point design team is: Lou Qualls, Nick Brown, Ben Betzler, Juan Carbajo, Scott Greenwood, Richard Hale, T.J. Harrison, Jeff Powers, Kevin Robb, and Aaron Wysocki. Additional contributors include Cole Gentry, Askin Guler, Jess Gehin, and Andrew Worrall.

5:00 **Adjourn**

Day 2: Friday, April 15, 2016 (*Newell Perry Room*)

Session 2

9:00 – 10:15 **Consolidating the Neutronics Benchmark and Scoping the Next Stage**
Facilitators: Dan Shen, Lance Maul

Discussing the benchmark in light of yesterday's discourse and what we can look at next. Areas of interest may include burnup, control rods and any other point raised so far.

Discussion on how we should present and distribute the benchmark specification and how we should receive the results from participants.

10:15 – 10:30 **Break**

10:30 – 11:00 **Additional Concerns and Conclusions.**
Facilitators: Dan Shen, Lance Maul

Summary of outcomes for the neutronics working group discussion and any final discussion points.

11:00 **End of Neutronics Working Group Session**