



Overview of IRP Project

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Project Objectives and Outcomes

- **Objective 1 –**

- A comprehensive evaluation of existing TREAT Facility neutronics data using the next generation reactor core neutronics codes. This will be performed in accordance with established guidelines per the International Handbook of Evaluated Reactor Physics Benchmark Experiments (IRPhEP).
- Yield a fully characterized reactor core with dynamic input and feedback from the U.S. Nuclear Regulatory Commission (NRC) (via advisory board member participation) which may be utilized to support the safety case for the TREAT Facility restart.

Project Objectives and Outcomes

- **Objective 2 –**

- A complete thermal hydraulic characterization of existing sodium loop experimental data will be performed and documented using American institute of Aerospace and Astronautics Association (AIAA) validation hierarchy paradigm.
- Result in a documented basis for developing future sodium flow loops to be utilized within the TREAT Facility; these bases will be created by the industry user that is planning on employing such flow loops within the TREAT Facility in the near future (TerraPower, LLC).

Project Objectives and Outcomes

- **Objective 3 –**

- The collection of and benchmarking against new experimental thermal hydraulic data of a representative TREAT Facility water flow loop using the six guiding principles of good validation experiments identified by Oberkampf.
- Produce a documented water flow loop design and demonstration that is representative of a prototypic configuration for the TREAT Facility to provide operational information and benchmarking data; and a fully benchmarked thermal hydraulic model of the water flow loop that may be utilized for future TREAT Facility water flow loop safety analyses.

Project Objectives and Outcomes

- **Objective 4 –**

- A comprehensive instrumentation plan for the TREAT Facility that objectively aligns with the technical and functional requirements resulting from accomplishing Objective 1 and supplemented by Objectives 2 and 3.
- A documented and demonstrated basis for the selection and arrangement of in-pile instruments within the TREAT Facility that satisfy the needs for both steady state and transient test conditions.

- **Task 2 Status**

[illegible]

Project Timeline

- **Neutronics Benchmarks**

- **Steady-State:** IRPhEP (Year 1)
- **Transient:** IRPhEP (Year 2 and 3)

- **Loop Thermal-Hydraulics**

- **Sodium Loop:** Benchmark (Year 1, 2 and 3)
- **Water Loop:** Experiment (Year 1, 2 and 3)

- **Core Instrumentation**

- **Instrumentation Plan:** Plan Draft (Year 1)
- **Initial Benchmark Evaluation:** Evaluation (Year 2 and 3)

Project Deliverables (General)

- **Monthly Updates**

- Monthly power point presentations (our contributions 1 per quarter).
 - Task Leads to provide PI with slide information by **2nd Friday of the month.**

- **Quarterly Reports**

- Detailed task-by-task update End of each quarter
Submit to PI
 - All have been posted to the project website

- **Final Report**

- Compilation of all Project scope and outcomes 12/29/2018

Project Deliverables (Task Specific)

- **Neutronics Benchmark**

- Submit SS Benchmark for Peer Review
- Submit TR Benchmark for Peer Review

09/30/2016



09/30/2018

- **Loop Thermal-Hydraulics**

- Submit TH Sodium Loop Benchmark for Peer Review
- Submit TH Water Loop Benchmark for Peer Review

09/30/2018

09/30/2018

- **Core Instrumentation**

- Submit TREAT Core Instrumentation Plan Draft
- Submit Detailed Final Instrumentation Report

09/30/2016



09/30/2018

Thank You