Task 2.1 Progress Overview

Brian Woods

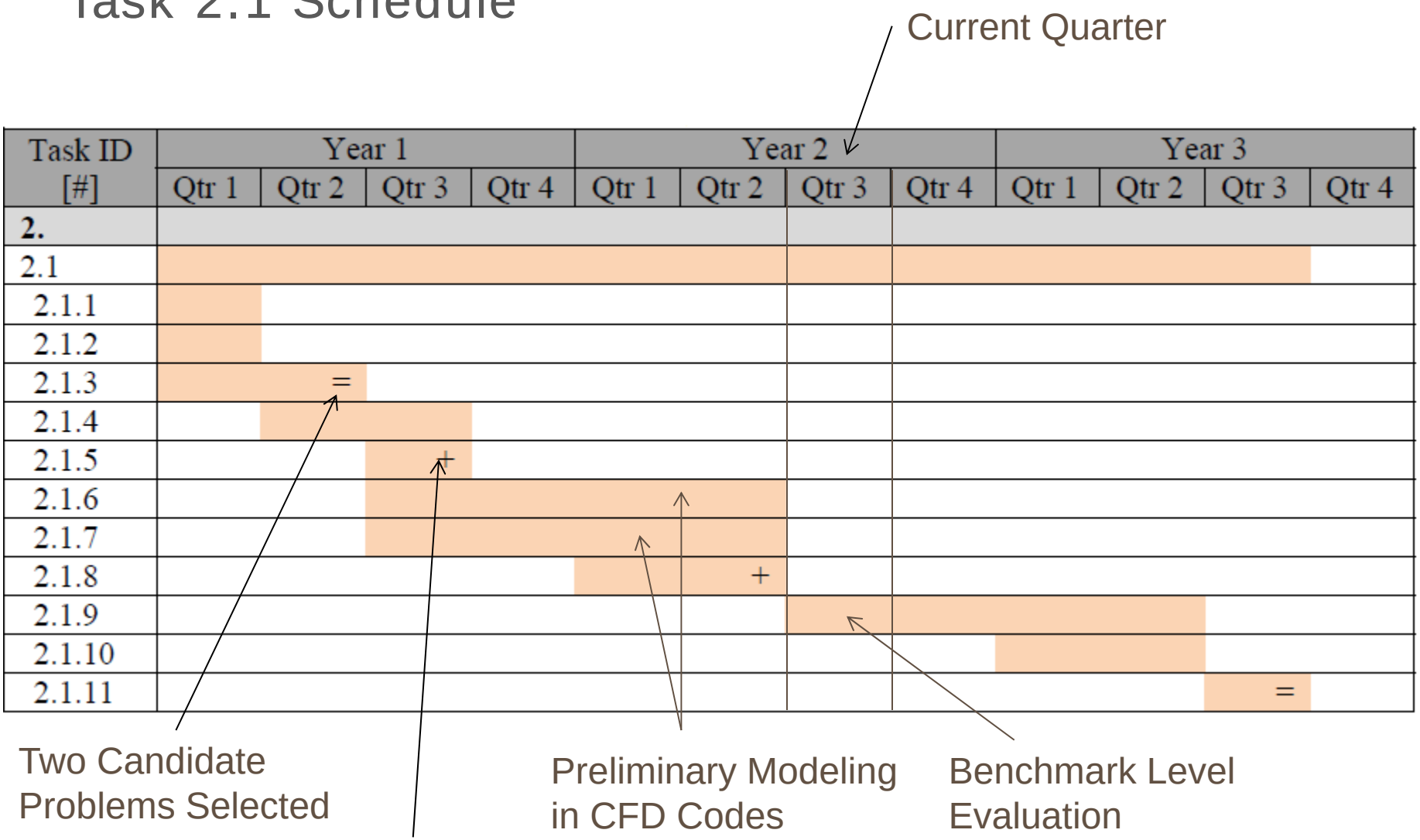
Task 2.1 Overview

- **Loop Thermal-Hydraulics**
  - A complete thermal hydraulic study will be conducted that focuses on the experimental loops placed within the TREAT Facility. These include a comprehensive evaluation of historical data collected from previous sodium experiments as well as expansion of existing data through design, development, and utilization of a new experimental loop that is representative of a proposed TREAT water flow loop.
  - **Sodium Loop**
    - Data from historically collected sodium loop calibration experiments will be used in a benchmark study against Nek5000 (DoE NEAMS code) and Star CCM+ (Industry code).

Task 2.1 Description

Task #	Description	Owner
2.1	Sodium Loop	
2.1.1	Survey literature of existing sodium test data	B. Woods
2.1.2	Select two candidate problems	B. Woods
2.1.3	Organize and document data for two candidate problems	B. Woods
2.1.4	Identify and review industry needs for sodium loop data	B. Woods
2.1.5	Down-select to one problem for benchmark evaluation	B. Woods
2.1.6	Preliminary modeling with industry tool Star CCM+	K. Weaver
2.1.7	Preliminary modeling with NEAMS code Nek5000	D. Pointer
2.1.8	Comparison of experimental data & model results for problem	B. Woods
2.1.9	Benchmark level evaluation of problem	B. Woods
2.1.10	Evaluation of uncertainties in selected problem	B. Woods
2.1.11	Submission of benchmark for peer review	B. Woods

Task 2.1 Schedule



Oregon State University

Task 2.1 Progress

- Down-select to one problem for benchmark evaluation Complete.
  - HOP 1-6A
    - One of the HEDL (Hanford Engineering Development Laboratory) Reference Fuel TREAT Tests.
    - Problem Specification document completed.
- January 2017 Meeting.
  - Determine the necessary models to create to perform the benchmark.
  - Begin with a commercial code as a scoping study to see if a single pin model will be sufficient for Nek5000 model

Task 2.1 Progress

- Preliminary Modeling using STAR-CCM+ of benchmark problem underway.
  - Estimate completion in Summer 2017.
- Preliminary Modeling using NeK 5000 of benchmark problem underway.
  - Estimated time of completion in Sumer 2017.
  - Supported by STAR-CCM+ scoping studies.
- Comparison of models against experimental results to commence following model completion.
  - Estimate completion Fall 2017.