Parametric Studies

John Carwardine

What is the primary goal...?

- Understand what is needed to achieve availability goal for 1-tunnel configuration with two HLRF variants
  - **Objective is not to score the different options – we assume that all three are technically viable (RDR, clustering, DRFS)**
- Basis the pre-existing model for the 1-tunnel RDR configuration
  - **Model the two HLRF variants**
  - **Everything about the model remains the same except for the HLRF and necessary first-order impacts**
- Analysis of results
  - **Look at overall model (the invariant part) and assess necessary improvements (how do we pick?)**
  - **Look at the two HLRF variants and assess what improvements would be needed that are specific to each variant**

Secondary goals

- *Understand the trade-offs and impact of the major assumptions in Availsim*
- What are the major downtime drivers?
  - **Tom's lists show no dominant downtime drivers (there appear to be many with similar downtime contributions)**
  - **Getting a flow switch that is 10x better is not a fundamental R&D issue. (QA, buy better components,...)**

Technical trade studies

- Generate a curve of availability vs operating energy (with the 3% RDR overhead assumed)
  - **First order: simple (number of RF units available**
  - **Second order effects: not so simple (more reliable equipment because of lower operating point)**
- Sensitivity to klystron reliability and replacement time

Operations scheduling model

- Scheduled operating hours: ~6500hrs/yr (9 mths)
- Useful hours for physics: 85% of 6500 = ~5500 hrs/yr

- Non-physics time:
  - **~2200 hrs/yr not scheduled for operation**
  - **Unscheduled downtime for repairs + recovery**

- How is the 2200 hrs apportioned...?
  - **Scheduled machine studies**
  - **Scheduled shutdowns**

- Assessments (examples)
  - **Availability vs number of operating hours**
  - **Scheduled vs opportunistic maintenance**