Preliminary Results: Beaver Valley PTS Analyses

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Beaver Valley PTS Analysis

- PRA model (SAPPHIRE)
  - Large event trees / small fault trees
  - Nearly all data is generic based on actual experience
  - Human action values considered "realistic" but with conservative bias (basis: BV procedures, training…)
  - Multiple initiators (many are BV support system losses)
  - Beaver Valley systems/dependencies
- Thermal hydraulic model
  - RELAP of Beaver Valley
- Probabilistic Fracture Mechanics
  - FAVOR (post-2/2002 version) of Beaver Valley

PRA, T/H, PFM Interaction & Integration
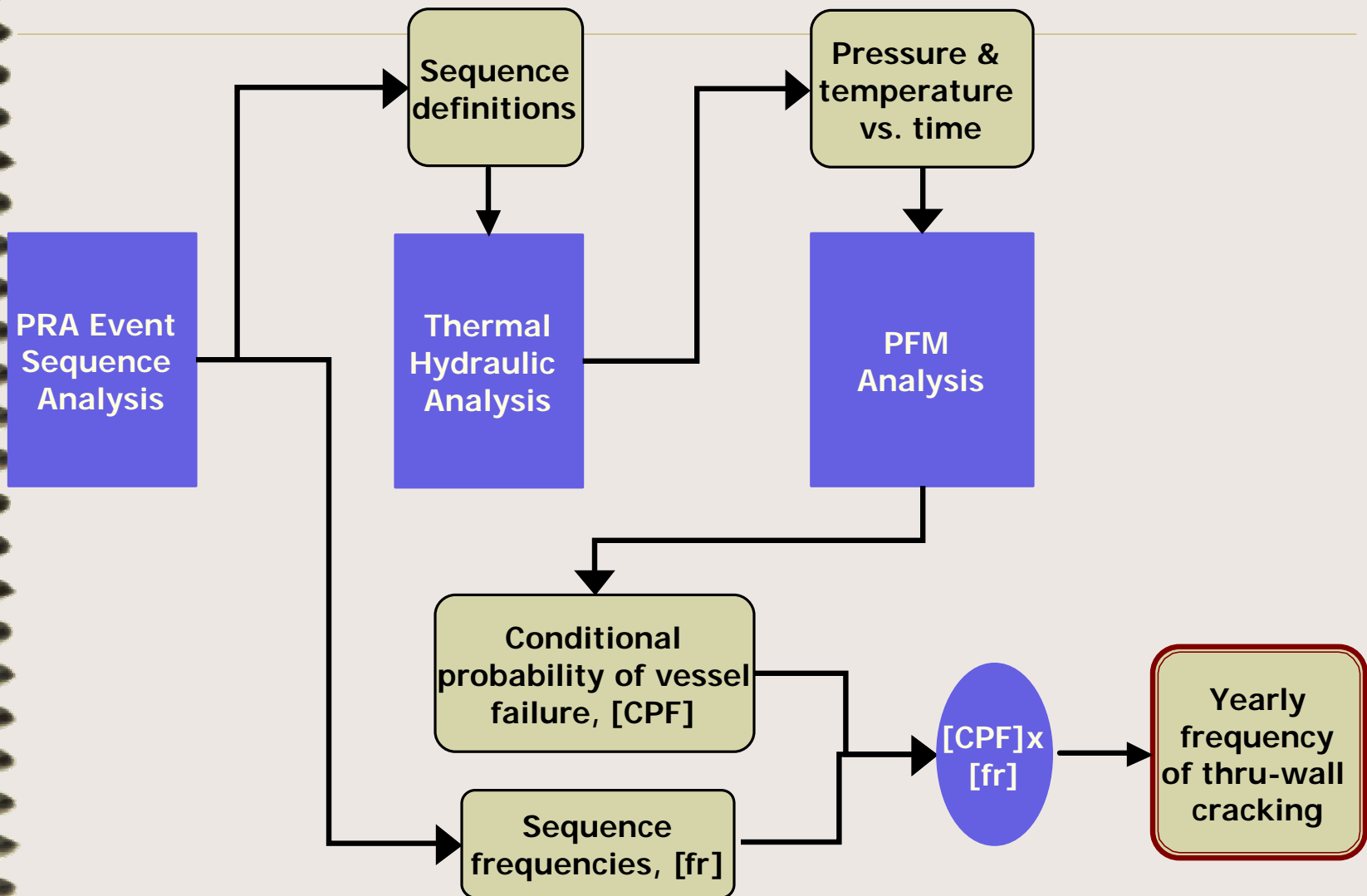
Scenario Modeling Considerations

- In model (prelim CPI/CPF x scenario frequency is potentially high)
  - LOCAs: 1.5" to 22"
  - 2 PORVs open/both reclose
  - 1 PZR SRV open/recloses
  - 2 PZR SRVs stuck-open including possible reclosures
  - Feed & bleed (all 3 PORVs)
  - Small (at least equivalent to 3 secondary safeties) to large main steam line break (upstream of MSIVs)
  - SG overfeeds (but probably will be relatively unimportant)

- Excluded from model (prelim CPI/CPF x scenario frequency is low {~E-11/yr})
  - 1 or 2 PORVs stuck-open
  - 1 PZR SRV stuck-open
  - 3 or less stuck-open secondary valves even with cont'd. feed
  - Combinations of secondary valve openings & PZR PORV/SRV openings/LOCAs
  - SGTR events

PRELIMINARY Results

- LOCA frequencies (<E-3-E-6/yr) x CPFs (<E-2-E-4) yield $\leq$ E-7/yr thru-wall failure frequencies

- Feed and bleed (<E-5/yr) x CPF (<2E-4) yields ~E-9/yr thru-wall failure frequency

- 2 stuck-open SRVs (~E-5/yr) x CPF (<2E-5) yields ~E-10/yr thru-wall failure frequency

- 1 (~E-3/yr) or 2 (~E-5/yr) stuck-open SRVs and reclosures are still being looked at but could be ~E-8/yr thru wall failure frequencies

- Large main steam line break with failure to isolate feed (~2E-5/yr) still being checked including inadvertent RCPs shutoff (~E-7/yr)

- Other scenarios still being looked at but are expected to be lower contributors

- Bottom line: LOCAs & multiple PZR stuck-open valves (including reclosures) appear to dominate PTS risk

Next Steps (PRA model)

- ## We Are Requesting Comments
  - Initiators, event tree structures & dependencies
  - Data (do any look very inappropriate?)
  - Human actions (do values appear reasonable?)

    (Note: HPI throttling/subsequent RCS pressure control is still a key action with a screening value of 50-50; in most cases will be ~0.1 or less in final analysis)
  - Other comments / observations

- ## Revise/complete analysis including full integration with uncertainties