Summary of FNS/1-1: Configuration Studies for an ST-Based Fusion Nuclear Science Facility (FNSF)

- Ex-vessel PF coil set identified to support range of equilibria with Super-X/snowflake divertor to mitigate divertor heat flux
- 0.5MeV NNBI optimal for heating & current drive for R=1.7m
- Vertical maintenance approach and test-cell layout identified
- Shielding adequate for MgO insulated inboard Cu PF coils
  - Outboard PF coils (behind outboard blankets) can be superconducting
- Calculated full 3D TBR, TBR reduction from TBM, MTM, NBI
- **Threshold major radius for TBR ~ 1 is $R_0 \geq 1.7$m**
- **R=1m TBR = 0.88 → 0.4-0.55kg of T/FPY → $12-55M/FPY**
- R=1m device will have lower electricity and capital cost → future work could assess size/cost trade-offs in more detail