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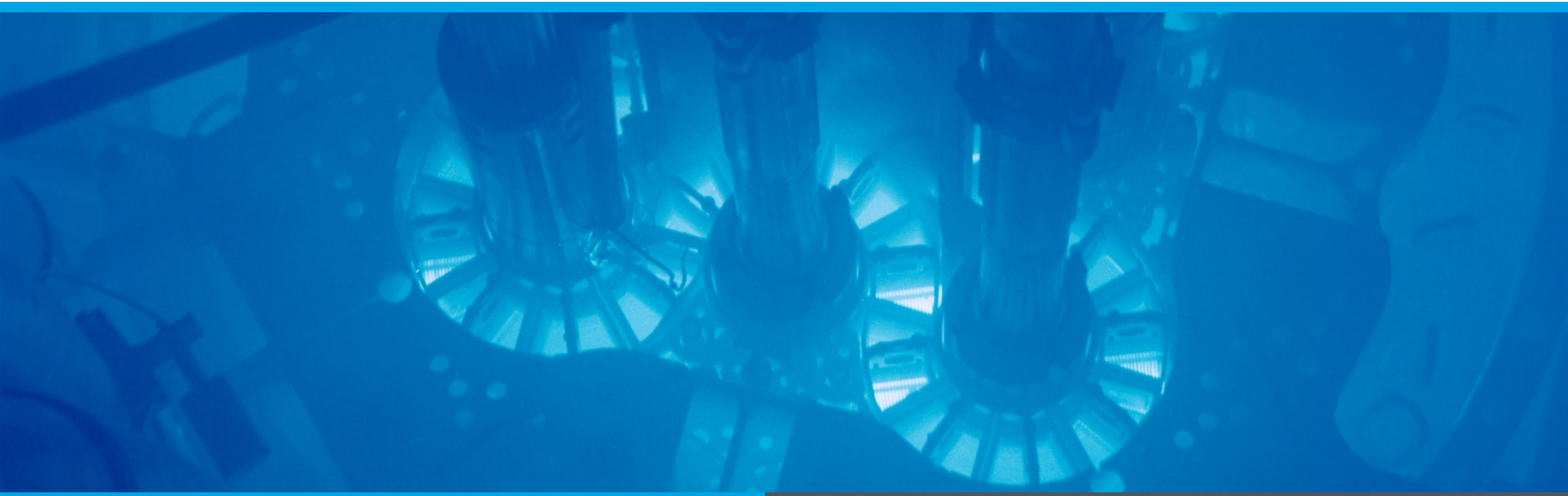

# Investigation of Thermal-Hydraulic Effects of Dry Storage Canister Helium Backfill Loss Using the HDCS

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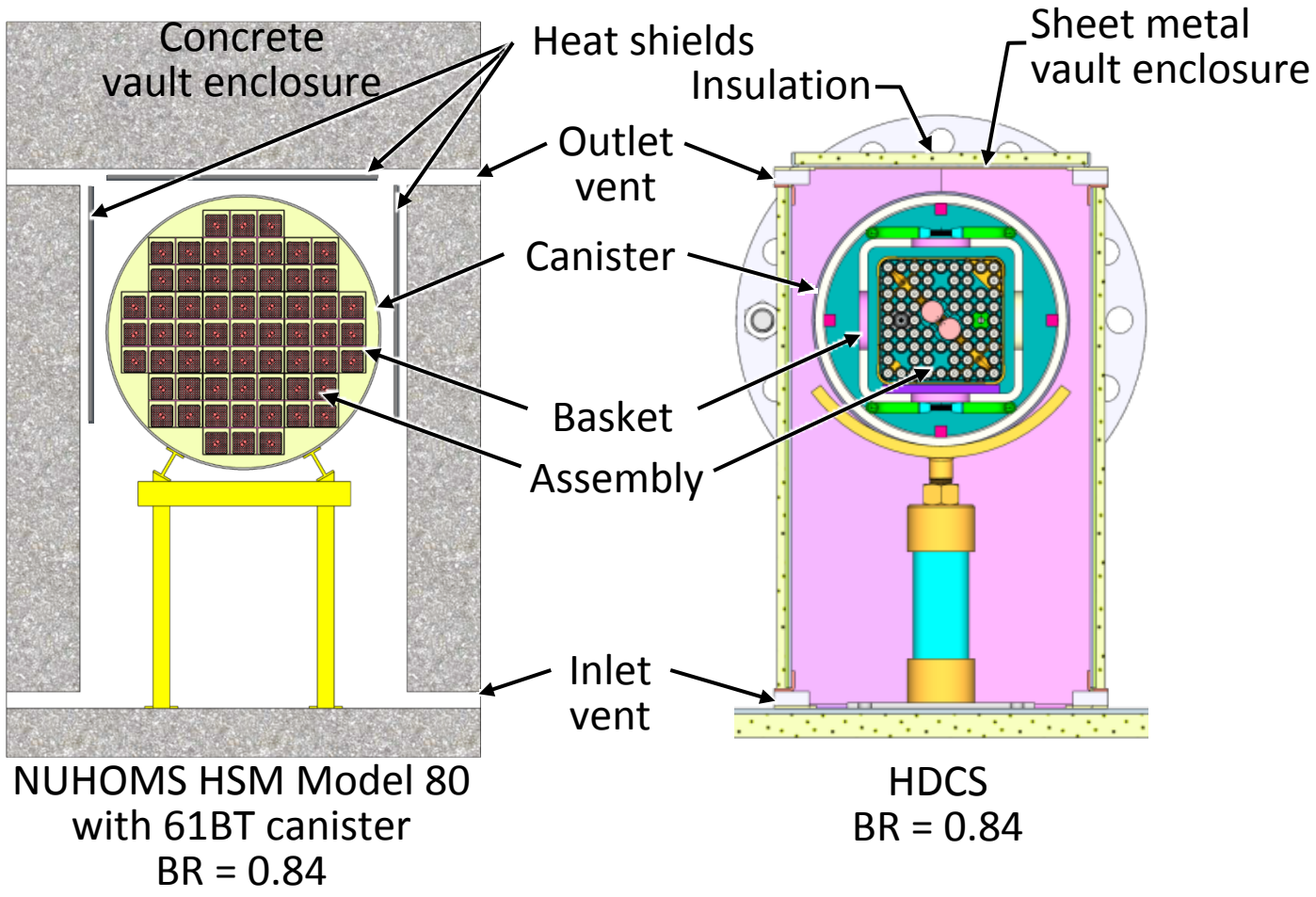
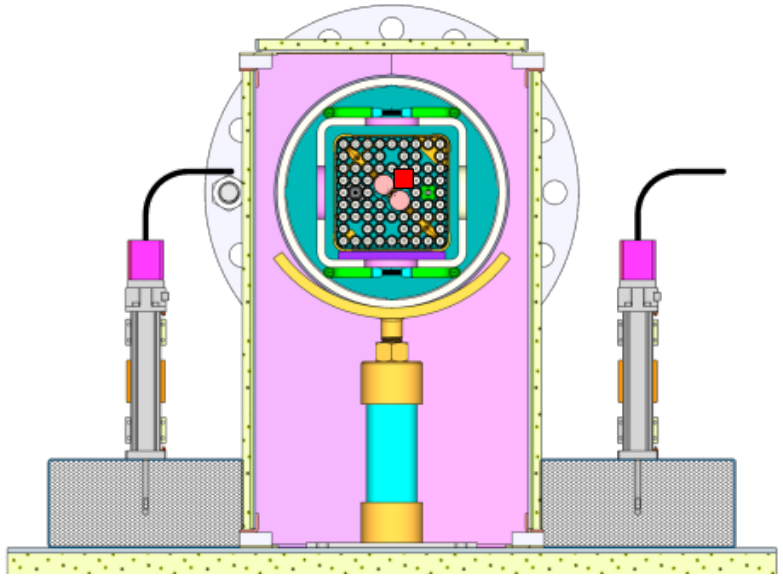
# HDCS Project Goal

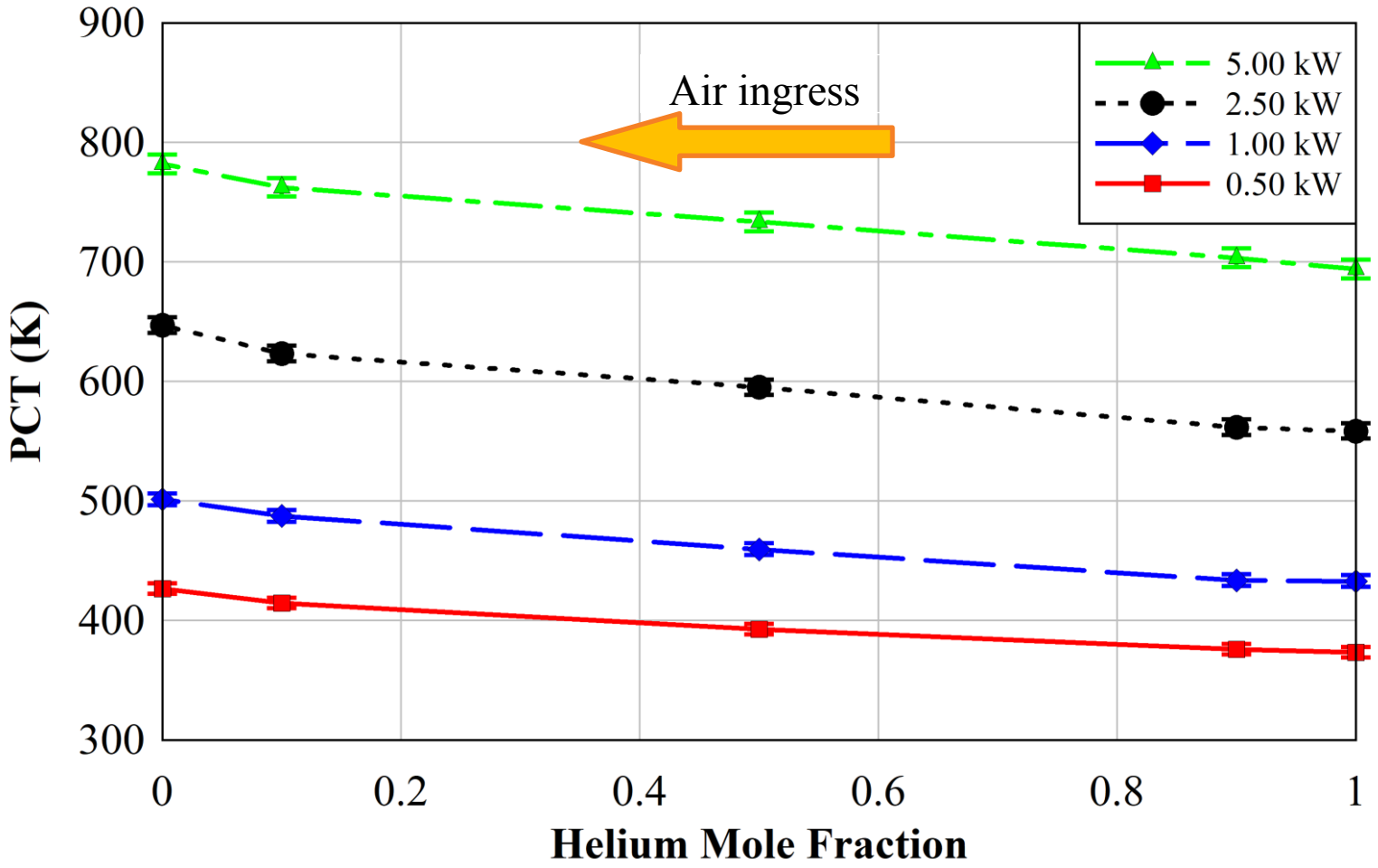
- Project goal: Simulate commercial horizontal dry cask storage system
  - Response to a need for modern model validation
    - Determine effectiveness of modern codes in predicting dry cask storage system peak cladding temperatures
  - Goal of this study: Investigate thermal-hydraulic effects of loss of helium backfill in a horizontal dry storage canister
    - PNNL modeling report: Thermal Sensitivity to Canister Internal Environment
      - DOE Milestone M3SF-21PN010203021
  - Wide range of test parameters
    - Decay heats, gas backfills, and internal pressures
  - Collect validation-quality data
    - Temperatures and external air mass flow rates



# Peak Cladding Temperature (PCT) vs. He Mole Fraction

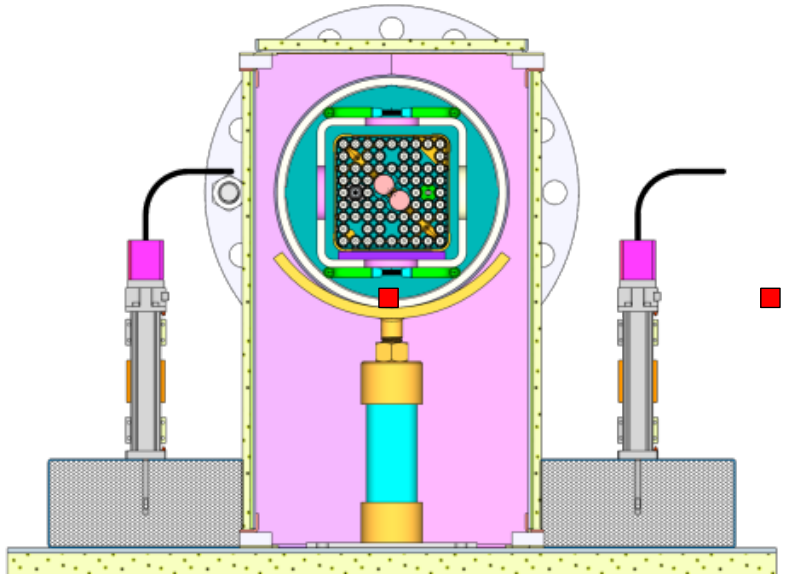
- For each power, the PCT increases with decreasing helium mole fraction

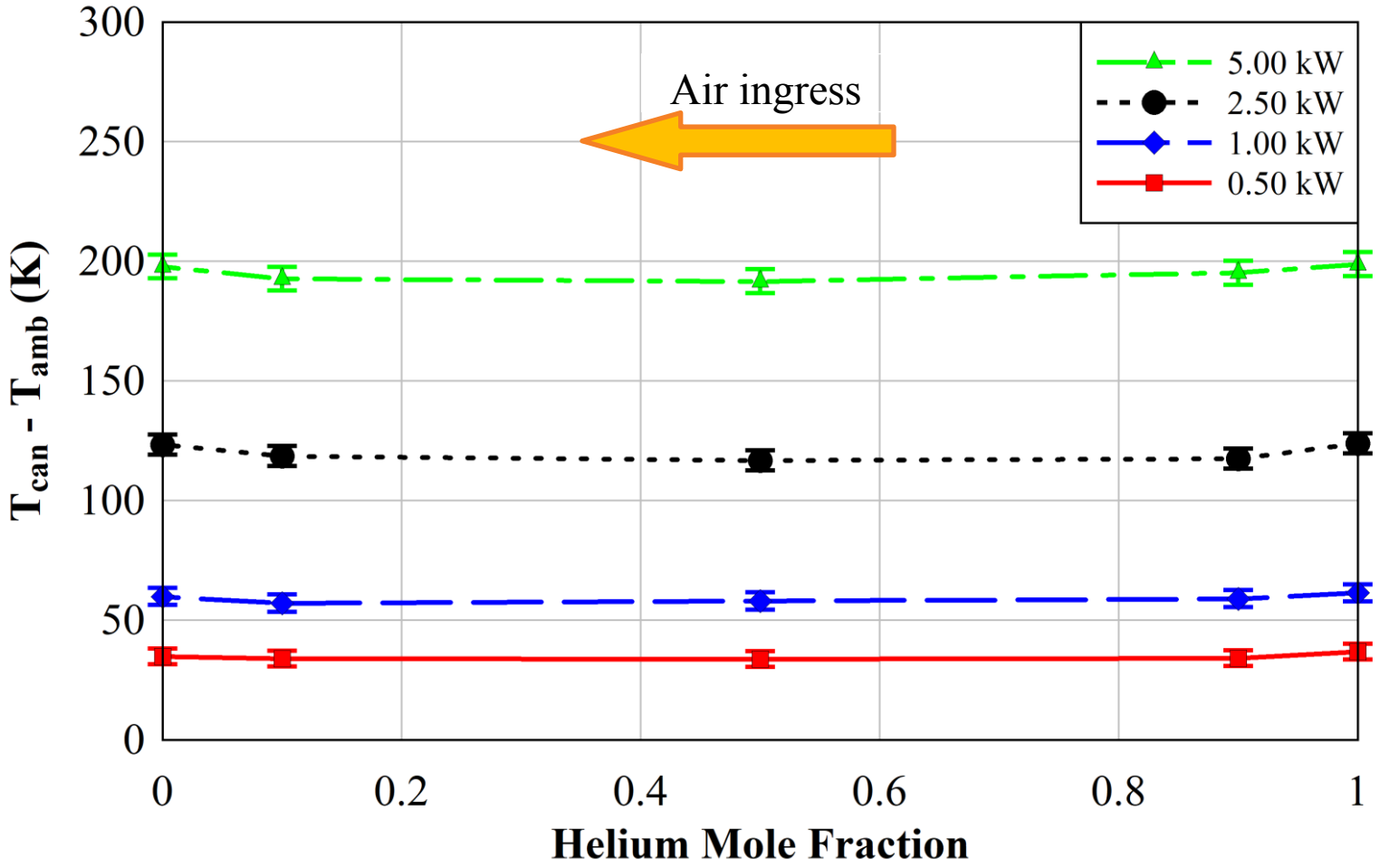




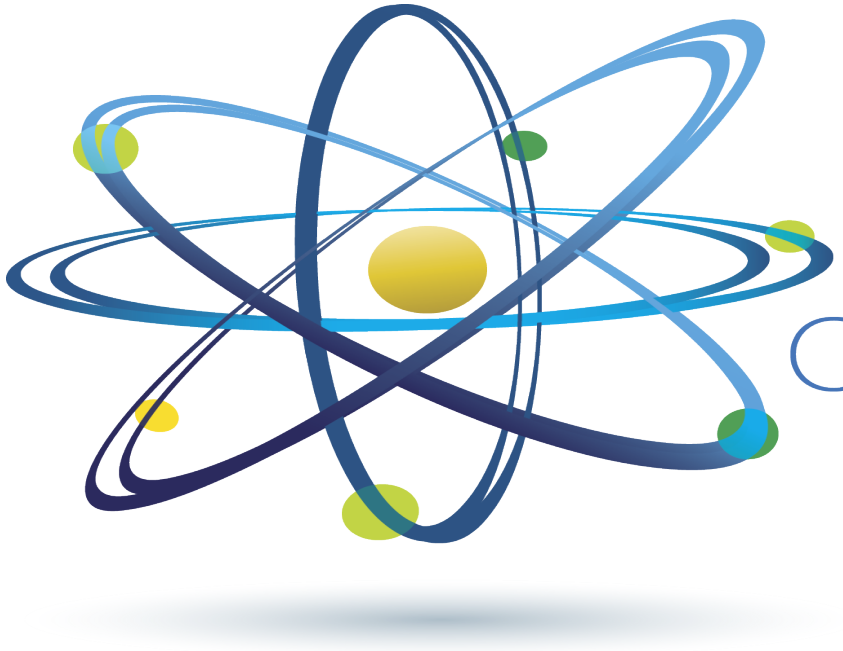
# Canister/Ambient Temp. Difference vs. He Mole Fraction

- For all powers, decreasing helium mole fraction does not correspond to changes in canister wall/ambient temperature difference





# Questions?



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