

# *LLNL R&D Plans*

December 12, 2012

N. Bowden  
T. Classen



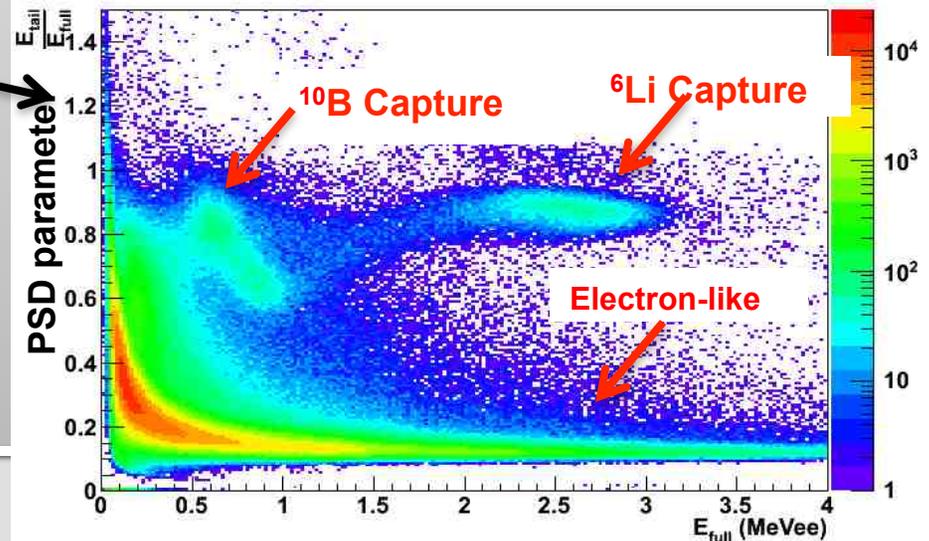
LLNL-PRES-528693

This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under contract DE-AC52-07NA27344. Lawrence Livermore National Security, LLC



# Background Measurement

- Assemble and deploy mobile system in portable shock-mounted rack:
  - Overburden estimate: Plastic muon paddles
  - Gamma Rate/Spectrum: NaI crystal
  - Fast Neutron Rate/Spectrum: EJ309 Liquid Scintillator Cell
  - Thermal Neutron/ correlated neutron events: 5" Plastic/LGB and/or  $^3\text{He}$  tube
  - ...
- Measure through Rx On-Off transition
- Assess all sites with same system for (at least) relative comparison

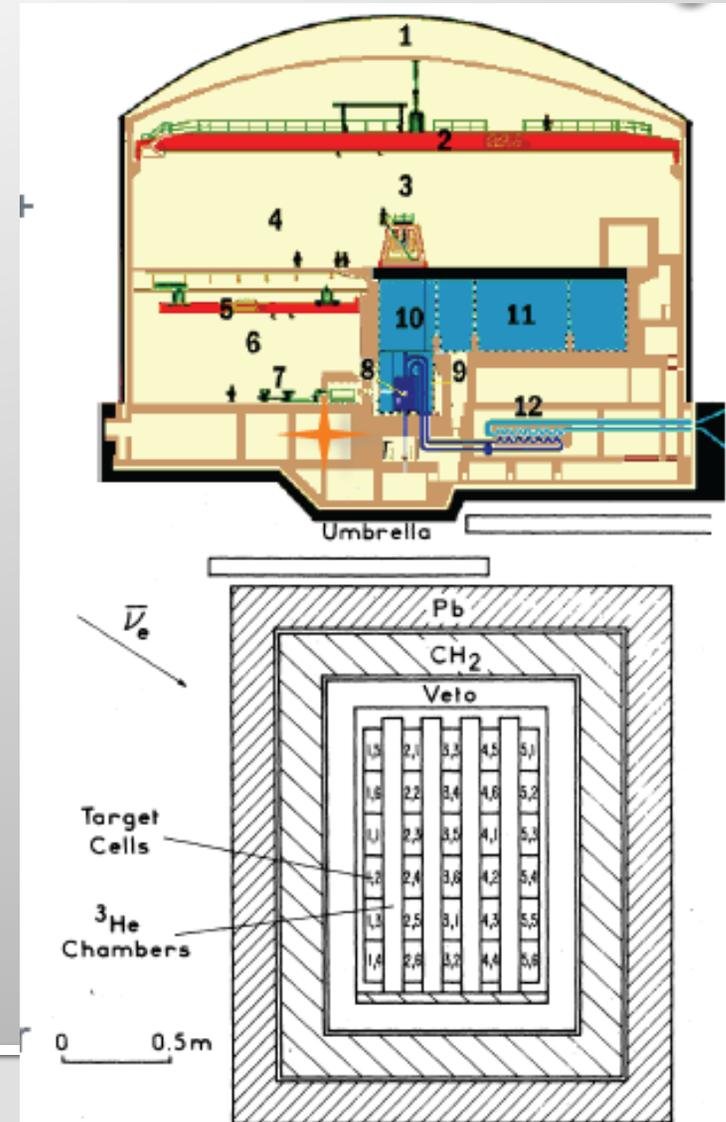
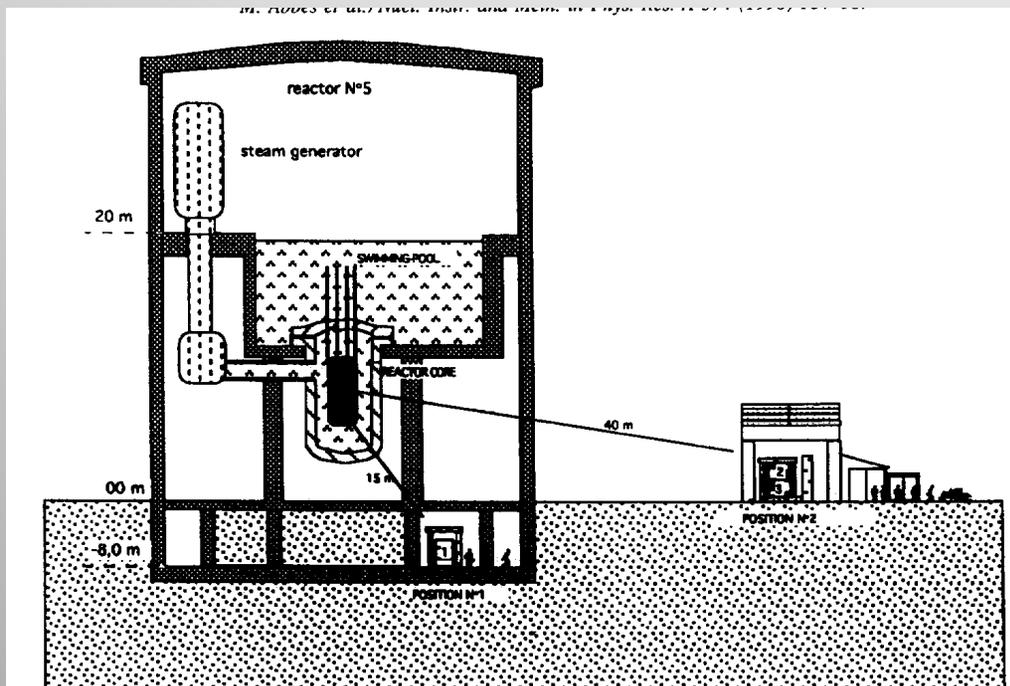


# Homogenous Design studies

- Study further effect of reflector and aspect ratio on axial position resolution and energy resolution
- Gamma catcher trade study: better to have
  - more target, or
  - more selectivity and better absolute normalization?
- Shielding Configurations:
  - Optimization of hydrogenous vs dense shielding (dependent upon overburden and Rx background)
- Likely should focus on collaborating on segment development

# Site/Shielding Studies

- Estimate overburden at each site
- Compare with previous shallow efforts, including our own SONGS efforts



# Detector Material Studies

- $^6\text{Li}$  Plastic & Liquid:
  - Discuss fabrication with Eljen, perhaps procure test piece
    - On basis of this experience, assess feasible time scale for mass production
  - Test PSD response with 5" PMTs of varying specification (and cost)