

# Fission Product Screening Using a Portal Monitor



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# Purpose



- To determine the validity of using the TPM 903B Portal Monitor in **triage** of the public after a nuclear reactor accident resulting in a fission product release
- The purpose is **NOT** to determine the level of patient dose, but to prioritize individuals for further testing and possible treatment



# Methodology



- Fission products of concern
  - Half life
  - Toxicity index (Release Fraction x Activity x Dose Coefficient)
- Establish detector response to gamma-emitting fission products for adipose male and child phantoms
  - MCNP Model
  - Biokinetic Data
- Incorporate dose contribution from non-gamma-emitting fission products
- Determine total body counts registered by the detector equivalent to a committed effective dose of 250mSv

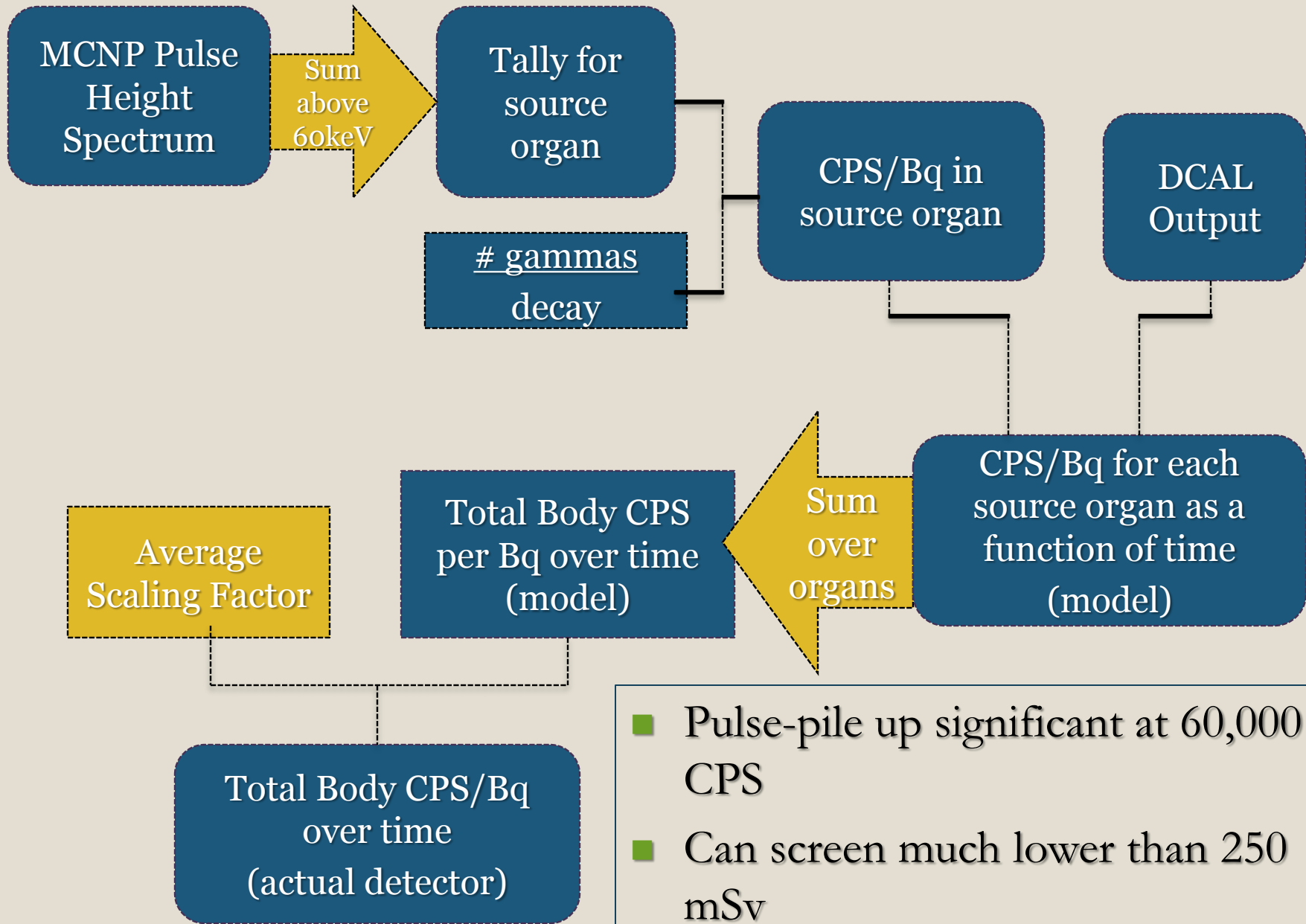


# Fuel Data



- **ORIGEN Calculated Fission Product Inventory:**
  - Type: PWR Westinghouse 17 x 17
  - Fuel: 27271 kg Uranium, 3.3% enrichment
  - Burn-up: 33,000 MWd/MTU
  - Operating Power: 1000MW<sub>e</sub>
  - Reactor accident resulting in a severe core melt at the end of the fuel cycle, allowing a release of fission products into the atmosphere
- Release is characterized as an ex-vessel release





- Pulse-pile up significant at 60,000 CPS
- Can screen much lower than 250 mSv



# Detector Sensitivity

