Nuclear Energy Advanced Modeling and Simulation (NEAMS) Annual Review

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Advanced Reactor Modeling and Simulation Workshop #2
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MOOSE-BISON-MARMOT toolset provides an advanced, multiscale fuel performance capability

**Mesoscale Material Model Development Tool**
- Simulates microstructure evolution in fuels under irradiation
- Used with atomistic methods to develop multiscale materials models

**Engineering-scale Fuel Performance Tool**
- Models LWR, TRISO and metallic fuels in 2D, 3D
- Steady-state and transient reactor operations

Simulation framework enabling rapid development of FEM-based applications
High Impact Problems (HIPs)

• High impact program concept introduced as a mechanism by which to direct NEAMS tools to address problem of applied relevance.
  • Core program is the “chassis” upon which HIP is built

• 3-year, ~$3M projects with a defined customer.

• Two HIPs initiated in FY15:
  • Evaluation of Representative Accident Tolerant Fuel (ATF) Candidates for the Advanced Fuels Campaign
    – Customer = Advanced Fuels Campaign

  • Numerical Evaluation of Advanced Steam Generators for SMRs
    – Customer = NuScale