

RIC 2005

**Session G3 – Research Activities:
New Reactors**

**ADVANCED REACTOR
LICENSING REQUIREMENTS
AND UNIVERSITY ACTIVITIES**

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LICENSING CONCERNS OF ADVANCED REACTOR DESIGNERS

- Stability and Predictability in Regulations and Processes
 - Balance between required deterministic and probabilistic evidence
 - Requirements for defense-in-depth
 - Requirements for conservation
 - Requirements for design features
 - Acceptance criteria and uncertainties
- Wish to be Rewarded in Licensing for use of Innovative Conceptual Features
- Favor NRC Using Concept-Specific Guidance via Regulatory Guides

REPRESENTATIVE UNIVERSITY ADVANCED REACTOR-RELATED PROJECTS

Georgia Institute of Technology

- Development of Advanced Methods for Pebble-Bed Reactor Neutronics: Design, Analysis and Fuel Cycle Optimization

Massachusetts Institute of Technology

- Quantification of Safety Margins
- Contributions to Risk-Informed Technology-Neutral Reactor Licensing
- Test Reactor Studies of Enhanced Pebble Bed Reactor Fuels
- Alloy Development for High Temperature Service
- NNGP Energy Conversion Systems
- Engineering and Physics of the Fast Gas Reactor
- Development of the Pebble Bed Gas Cooled Reactor
- High Performance Fuel Design for LWRs
- Feasibility Study of Internally and Externally Cooled Fuel
- Supercritical Water Reactor Development
- Use of Solid Hydride for Improved Lead-Cooled Reactors

REPRESENTATIVE UNIVERSITY ADVANCED REACTOR-RELATED PROJECTS, continued

University of Michigan

- Neutronic Analysis for the Very High Temperature Gas-Cooled Reactor

University of Tennessee

- Mars Advanced Reactor, Integrated, Direct Coupled (MARID): A Mars Rover Recharging Station
- HERMES: Helium Cooled Reactor and Mars Exploration Station
- Advanced High Temperature Reactor – AHTR 667
- Fault Detection and Isolation of IRIS Helical Coil Steam Generators