USRA Symposium

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Technology Demonstration Mission Program
Space Nuclear Propulsion

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Thoughts on Space Reactor Design

- **It's important to avoid automatically applying terrestrial reactor design philosophies to space reactor design efforts**
  - In terrestrial reactor design, a primary consideration is usually ensuring the reactor can be shut down and cooled in the event of an emergency
    - ✓ Terrestrial reactor integrity must be ensured to prevent the release of radiation and fission products
  - In space reactor design, the primary consideration may need to be ensuring the reactor can be started up and ensuring that the engine will provide thrust
    - ✓ Crew safety needs to be paramount
    - ✓ Launch safety also needs to be ensured
- **The differences in design philosophy has some potentially wide-ranging implications**
  - There are reactor safety features that need to be evaluated in light of how they might affect astronaut protection
  - Fuel performance standards may need to be evaluated
  - Quality assurance standards could be affected
  - Qualification test planning could be affected
  - Testing infrastructure may need different designs