Research and Test Reactor Briefing

December 16, 2014

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TRTR

- National Organization of Test, Research and Training Reactors
- Members from 40+ research reactors in U.S. and Canada
- Adjunct members from other nations
- Promotes the use of non-power reactors in science and engineering education and research and the application of technology in areas of national concerns.

Research and Test Reactors (RTRs)

- Licensed thermal power levels range from a few watts to 20 MW.
- 42 RTRs currently licensed by NRC
  - 31 operating
  - 25 at universities
  - Most are class 104 research and development licenses (10 CFR 50.21)

RTR overview

- **Research and education mission requires a fundamentally different design from power reactors.**
  - Core volumes are much smaller
  - Designed to produce high neutron fluxes with much lower thermal outputs
  - Require much less fuel
  - Far lower fission product inventories
  - Lack the stored energy of power plants

RTR usage

- **RTRs offer unique tools for research:**
  - Radiation environment for materials testing
  - Neutron scattering for probing of matter
  - Neutron activation for trace element studies
  - Radioisotope production
  - Medical applications of neutrons
  - Other applications, such as neutron transmutation doping of semiconductors

RTR usage (cont.)

- **Unique hands-on education tool for the next generation of engineers and scientists as well as educating the public and demonstrating the safe and effective use of nuclear reactors.**

TRTR/NRC interactions

- **TRTR provides a forum for engagement of reactor managers, operators, and users on a variety of issues.**
- **We regularly interact with the NRC RTR group and greatly appreciate their availability and professionalism.**

Security

- We recognize the need for periodic reassessment of security requirements at RTRs.
- We also appreciate the recent opportunity to interact with NRC on proposed changes to 10 CFR 73.
- It should be recognized that increasing security requirements could substantially inhibit the research and education mission of RTRs.

Digital Instrumentation

- Digital instrumentation offers the ability for greatly improving information flow to the reactor operator and improving safety.
- Proposed requirements for power reactors, such 10 CFR 50.55(h), are not appropriate for RTRs
  - Unnecessary given the low safety significance of failure.
  - Implementation may be beyond the available resources of many RTRs.
  - Would ultimately discourage upgrading of instrumentation.

Digital Instrumentation (cont.)

- We support the NRC development of guidance for the use of digital instrumentation for RTRs.
- Any NRC regulations or staff guidance should
  - take into account the minimal risk presented by RTRs.
  - keep RTR requirements at an absolute minimum as mandated in section 104(c) of the Atomic Energy Act.

Relicensing

- In recent years, the relicensing process has become much more complex without substantive improvement in safety.
- TRTR appreciates efforts made by NRC to alleviate the relicensing backlog.
- TRTR supports recent NRC initiatives to have non-expiring licenses for RTRs as long as
  - regulatory requirements are consistent with the safety risks presented by RTRs.
  - there is no increased regulatory burden.

MIT Relicensing

- **MIT submitted application for relicensing on July 8, 1999**
  - No major infrastructure changes
  - Upgrade from 5 MW to 6 MW

MIT Relicensing Timeline

- Initial submittal: July 8,1999
- 1st round of questions (135): 2000-2002
- 2nd round of questions (40): 2008
- Final round (49): 2009
- License issued November 1, 2010
- Total of 11.3 years

MIT Relicensing Challenges

- Sept. 11 issues interfered.
- NRC Contractors reviewing the Safety Analysis Report changed during the review.
  - Some questions were reasked.
- Other license amendments issued during the review made it difficult to track current versions of documentation.
- Very few significant changes during the entire review.

MIT Relicensing

- **Successes:**
  - MIT analytical capabilities updated.
  - Power upgrade presented no problems.
  - Mechanism now in place to keep SAR current.
- **Suggestions:**
  - Resolution of minor items, such as typographical errors should have less formal process.
  - Relicensing process should be simplified, focusing on safety-related issues.

Thank you. Questions?