Advanced Fuel Cycle Facility Licensing

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Topics

• Advanced Fuel Cycle Facilities
• Facets of Fuel Facility Licensing
• Regulations
• Review Guidance
• Risk Insight
• Facilitating an Efficient Safety Review
Advanced Fuel Cycle Facilities

• Higher enrichment and burnup for light-water reactor oxide fuel

• Accident tolerant fuel
  – Coated cladding, nonzirconium cladding, metal fuel, uranium silicide (U₃Si₂) fuel

• Advanced reactors
  – Metal fuel, salt fuel, TRISO fuel
Facets of Fuel Facility Licensing

• Safety
  – Enrichment (10 CFR Part 70)
  – Special nuclear material fuel processing (10 CFR Part 70)
  – “Production facility” (10 CFR Part 50)
  – Source material processing (10 CFR Part 40)

• Environmental (10 CFR Part 51)

• Physical security (10 CFR Part 73)

• Material control and accounting (10 CFR Part 74)

• Emergency plan (10 CFR Parts 40, 50, and 70)
Regulations

• The regulations in 10 CFR Part 70 appear adequate for advanced fuel cycles.
• The regulations are already used for a spectrum of processes (enrichment, fabrication) and enrichment levels.
Review Guidance

• Existing 10 CFR Part 70 review guidance reflects recognized hazards.
• The staff believes new hazards can be addressed adequately.
• Understanding risk significance will be important when addressing any new issue.
Risk Insight

• An understanding of risk is necessary for any new operation or facility:
  – What are the hazards/scenarios that are risk significant?
  – What is the risk relative to currently licensed operations?
  – What is the level and nature of the risk relative to the reactor?
Facilitating an Efficient Safety Review

- Conduct preapplication discussions with the staff to develop a shared understanding of the regulatory strategy, schedule, and important safety controls.
- Present and summarize information and analyses that provide risk insight.
- Present arguments using the criteria in the regulations.
Closing Thoughts

• The staff believes advanced fuel cycles can be licensed.
• A clear understanding of risk, the applicant’s regulatory strategy, and important safety controls will facilitate an efficient staff review.
• The applicant needs to integrate the safety, security, and environmental aspects of the application.