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Preparing for Regulation of Advanced Reactor Fuel Cycles

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Topics

- Strategy
- Industry-NRC interaction
- Observations
- Suggestions

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Vision and Strategy

NRC published its Vision and Strategy document in late 2016

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Industry – NRC Interaction An Essential Strategic Element

Interaction facilitates

- informed industry decisions on regulatory strategies
- NRC preparation for efficient reviews

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Industry – NRC Interaction (cont.)

Multiple forums/methods for interaction

- Meetings with future applicants
- NRC-DOE-Industry strategy sessions
- Industry white papers

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Industry – NRC Fuel Cycle Interaction


Learning about different fuels

- TRISO
- Metal
- Molten salt

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Fuel Cycle Regulations and Guidance

- Existing regulations (Parts 70, 71, 72) appear to be adequate
- Review guidance may need to be supplemented to address issues raised in applications

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Potential Changes for Advanced Reactor Fuel Cycles

- Higher enrichment
- New fuel materials
- New fuel designs
- New fuel processing technologies

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Potential Issues from Higher Enrichment

- Can impact many facets of the fuel cycle: enrichment, fabrication, transportation, storage
- Impacts in the areas of criticality safety, MC&A, physical security
- Limited criticality benchmarks between 10 and 20 percent enrichment

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New Fuel Processing Technologies

- Potential for new hazardous or reactive materials
- Potential for new spent fuel degradation mechanisms

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Environmental Information Needs

- Environmental impact information comparable to that in Tables S-3 and S-4 of 10 CFR Part 51

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Suggestions Going Forward

- Develop fuel cycle concepts in parallel with reactor development
- Discuss the concepts and plans with NRC staff
- Discuss any new safety issues

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