

US NRC's ATF Plan

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Overview

- Areas covered by NRC's ATF project plan
 - Assumptions
 - Open items
 - Activities
- Importance of early communication
- Conclusions and next steps

NRC project plan for ATF

- Outlines activities associated with *preparing the agency* to conduct an effective and efficient review of ATF
- Includes preliminary estimates of lead time necessary to complete activities in each area
- Focused on activities expected from *2017-2022*
- Is intended to be a living document

ATF plan assumptions

- NRC will not perform independent confirmatory testing
 - Data will be available from DOE, industry, and others
 - All integral fuel behavior data to be provided to NRC to perform code assessments
- Interaction with DOE, EPRI, vendors, and other organizations will take place:
 - in real time
 - in advance of experiments when possible
- Interactions with external stakeholders will keep staff and stakeholders informed about developments that can affect activities in the plan
- The NRC will be appropriately resourced to execute the activities in the plan

ATF plan open items

- Identify whether (and what) regulatory guidance needs to be generated to accommodate licensing ATF designs under current framework
- Establish channels of communication to ensure NRC receives up-to-date information
- Determine appropriate vehicles for industry to notify NRC of intent to initiate activities
- Identify any necessary changes to existing regulatory framework
 - Example: PRA and 50.69 licensing approaches

Meetings and stakeholder interactions

- Plan identifies key technical domestic and international update meetings, experimental program review meetings, and conferences
- NRC staff is committed to participating in industry project update meetings to maintain programmatic awareness of industry and DOE efforts

Regulatory framework

- More effort needed for “revolutionary” designs than for evolutionary designs
- Staff recognizes that there are potentially two types of alterations needed:
 - Adjustments to allow the use of ATF (e.g., regulatory guidance, changes to 50.68 to allow >5% enrichment)
 - Crediting the safety enhancements obtained by using ATF (e.g., the application of 50.69)

Transportation and fabrication

- Fresh and spent fuel transportation
 - Existing regulations and regulatory guidance are considered to be adequate for processing limited transportation requests for LTAs
 - Shipment of irradiated LTAs for PIE may require further interaction
- Fuel fabrication
 - Evolutionary design fabrication facility licensing can likely take place using existing regulatory processes
 - Scoping study necessary for revolutionary designs

Probabilistic risk assessment (PRA) activities (e.g., 50.69 LARs)

- More information needed from industry to create a meaningful plan
 - How does industry intend to credit ATF?
 - When does industry expect to engage with the NRC in this area?

Analysis capability development

- Disciplines include thermal-hydraulics, fuel performance, neutronics and source term analysis
- For each code, estimates consider the need for:
 - A scoping study to identify code development needs
 - Code architecture modifications (e.g. to remove Zr/UO₂ hard wired properties and assumptions)
 - Model development
 - Model validation
 - Integral assessment
- Lead times to develop full analytical capabilities can vary by discipline, code, and ATF design
- Lead time is longer for “revolutionary” designs than for more evolutionary designs

Importance of early communication

- Many of the activities in the plan have long lead times
- Advance awareness of plans and progress benefit budget formulation processes

Conclusion and next steps

- NRC staff will continue to attend meetings to remain informed on ATF progress
- Experimental data is a prerequisite for most work to prepare confirmatory codes
- Vehicles for initiating activities need to be firmed up
- Staff are prepared to participate in PIRT panels and other gap analysis exercises as they are organized by industry