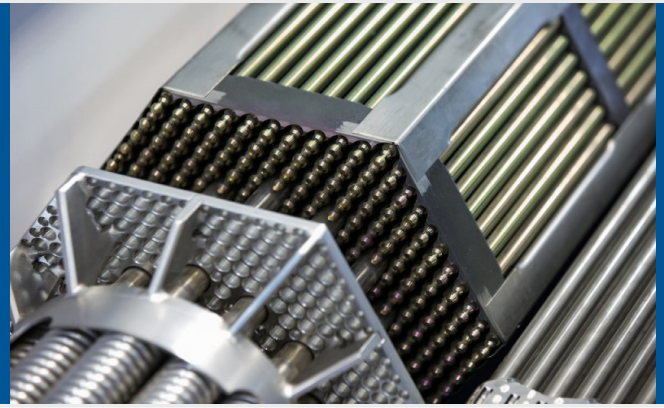
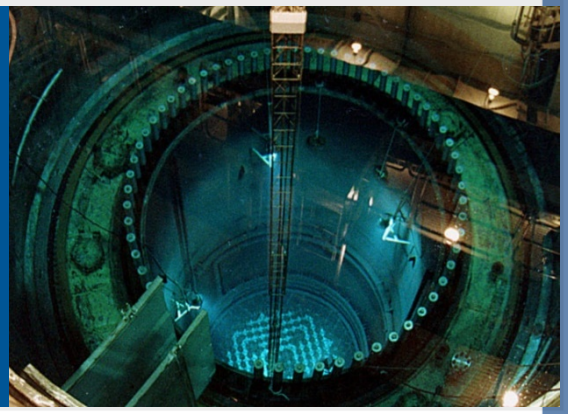
U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Higher Burnup Workshop

Schedules and
What Constitutes a Quality Submittal

July 30, 2020

New Paradigm and Cooperation

- ATF Project Plan developed to meet timelines
- ATF, including HBU/IE, has a high priority for the NRC and the industry, however, applications will receive the same level of review
- Early and frequent communication is key

Expectations, Schedules & Timeliness

- NRC will be performing multiple parallel reviews
- To allocate resources appropriately, NRC would like to:
  - Communicate our expectations for submittals
  - Discuss submittal and review schedules
  - Discuss the “amendment technology matrix”
  - Remain apprised of submittals and know how many licensees are expected to adopt

General Expectations for Quality Submittals

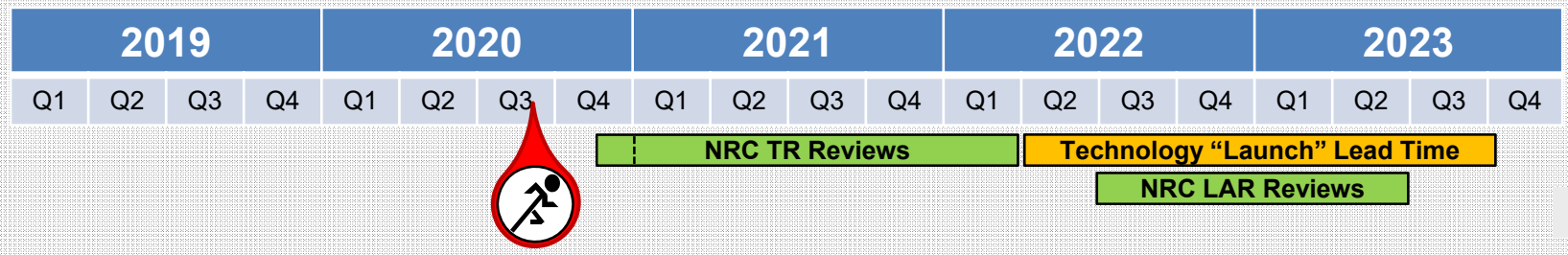
- Assertions or technical assumptions made in submittals need to be supported by a safety and/or technical basis to ensure an efficient and timely review.
- Need for continuous engagement

Expectations for Quality Part 50 Submittals

- Code/method suite validation
  - NRC SRP guidance remains applicable
  - Take note of past submittals and learn from them
    - Criticality experiments
    - Radiochemical assays
    - Physics tests measurements
  - Reassess and update uncertainty quantification
- Spent Fuel Pool
  - Exemptions and Criticality Safety
- Fuel Fragmentation, Relocation, and Dispersal (FFRD) Strategy must be addressed for HBU

Schedules and Timeliness for Part 50 Submittals

- In October 2019, NRC examined critical path for in-reactor HBU/IE submittals to support industry's 2023 goal:
  - Anticipated NRC review times:
    - 16 - 18 months Topical Reports (TR)
    - 12 months License Amendment Requests (LAR)
  - Assumption: 18 month technology "launch date" lead time
  - Submittal Time Frame:
    - TRs – November 2020/January 2021
    - LARs – June 2022 (?)



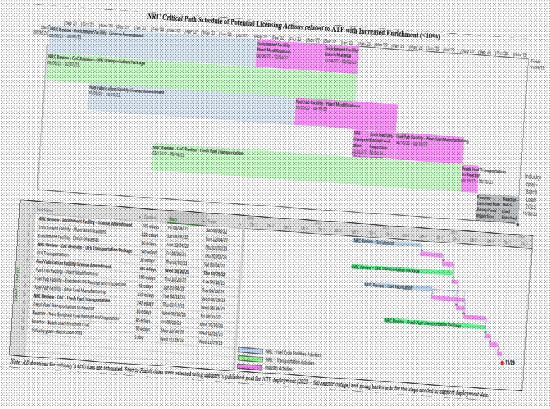
Expectations for Quality Part 70 Submittals

- Identification of facility changes and safety basis
- Criticality Safety
  - Revision to criticality safety analyses or methodology
  - Updates to criticality code validation report
  - Update to justification of minimum margin of subcriticality
- Updates to the Integrated Safety Analysis including changes in items relied on for safety or accident sequences.
- Any impact on other technical or program areas identified in NUREG 1520.

Expectations for Quality Part 71 Submittals for Fresh Fuel

- Criticality safety
  - Adequate subcriticality safety margin for optimum moderation of proposed contents
  - Adequate critical experiments and radiochemical assay measurements for criticality and depletion code validation
  - May incorporate the use of sensitivity / uncertainty analyses to show that existing critical experiments are applicable for validating criticality calculation methodology
- Configuration control
  - Adequate materials properties for ATF cladding materials
  - Evaluate potential reconfiguration of the assemblies.

Schedules and Timeliness for Part 70 and 71 Submittals



- In August 2019, NRC developed critical path for the front end of the fuel cycle to support industry's 2023 goal with IE:
  - Enrichment Facility LAR – August 2021
  - UF6 transportation package – August 2021
  - Fabrication Facility LAR – October 2021
  - Fresh fuel transportation package – February 2022

Expectations for Quality Part 71 and Part 72 Submittals for Spent Fuel

- Radiation shielding
  - Revised isotopic depletion and radiation dose analyses / verified and validated code analyses
- Heat removal
  - Revised decay heat analyses / verified and validated code analyses per current staff guidance
- Age-related phenomena

License Amendment Technology Matrix

- HBU and IE are two technologies that are part of a host of ATF technologies
- Matrix of possible license amendment technology combinations.

ATF Type	ATF Credit	HBU Phase	IE
Cr-Coated	Yes	1	No
Cr-Coated	No	2	Yes

- Most common?

Industry-Anticipated Submittals

- Timelines and subject matter of topical reports and license amendment requests
- How many licensee are expected to adopt?

Open Forum Question and Answer

Closing Remarks

If you have any remaining questions:

- Use the “Contact Us” on the ATF website
- Email: accident_tolerant_fuel@nrc.gov