

# NRC Public Meeting on Accident Tolerant Fuel

September 12, 2018

# Agenda

- I. NRC's ATF project plan
- II. Major revisions
- III. NRC's next steps

# I. ATF Project Plan

- Developed in anticipation of safety-enhancing technology being pursued on accelerated schedule
- Strategy and activities associated with preparing NRC to efficiently and effectively license ATF designs
- Addresses the complete fuel cycle
  - Fuel fabrication and fresh fuel transport
  - In-reactor requirements
  - Spent fuel storage and transportation

# Extensive Stakeholder Interaction

- **September 2017:** NRC public meeting outlining plans for ATF project plan
- **December 2017:** Published in Federal Register for public comment
- **February 2018:** Briefed ACRS subcommittee on draft plan
- **February 2018:** NRC public meeting on public comments
- **April 2018:** NRC Commission briefing on ATF
- **May 2018:** DOE/NRC ATF coordination workshop
- **June 2018:** NRC public meeting on ATF PIRT strategy
- **Summer 2018:** Individual engagements with ATF vendors
- **Today**

# Addressed Overall Themes of Stakeholder Comments

- Importance of enhanced communication
- Opportunity to transform fuel licensing process
- Leverage advanced computational capabilities
- Concerns with regulatory requirements associated with lead test assemblies

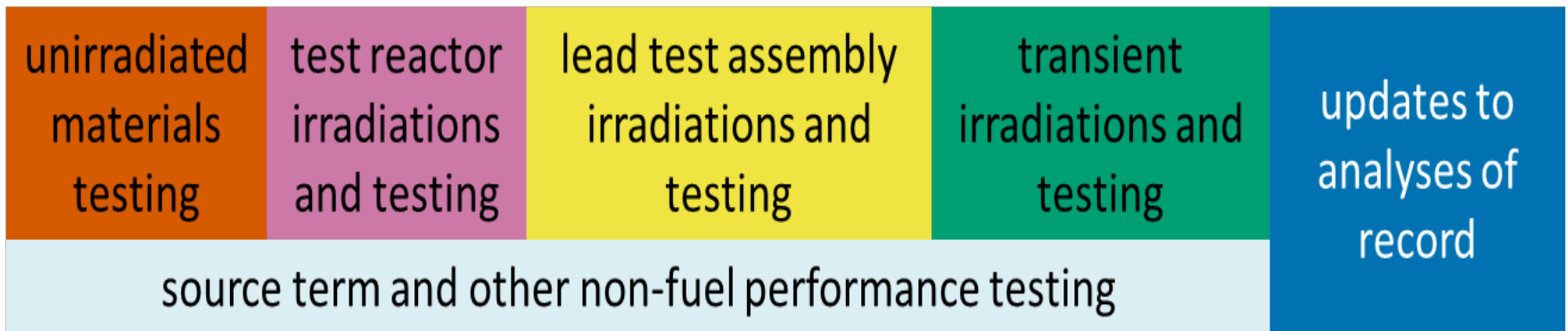
# II. Major Revisions

- One, inclusive document
- ATF licensing process details
  - Milestone schedule
  - Project plan paradigm
  - Concept-specific licensing roadmaps
  - ATF PIRT strategy
- Regulatory Issue Summary (RIS)
- Code development details to appendix
- Path forward

# ATF Milestone Schedule

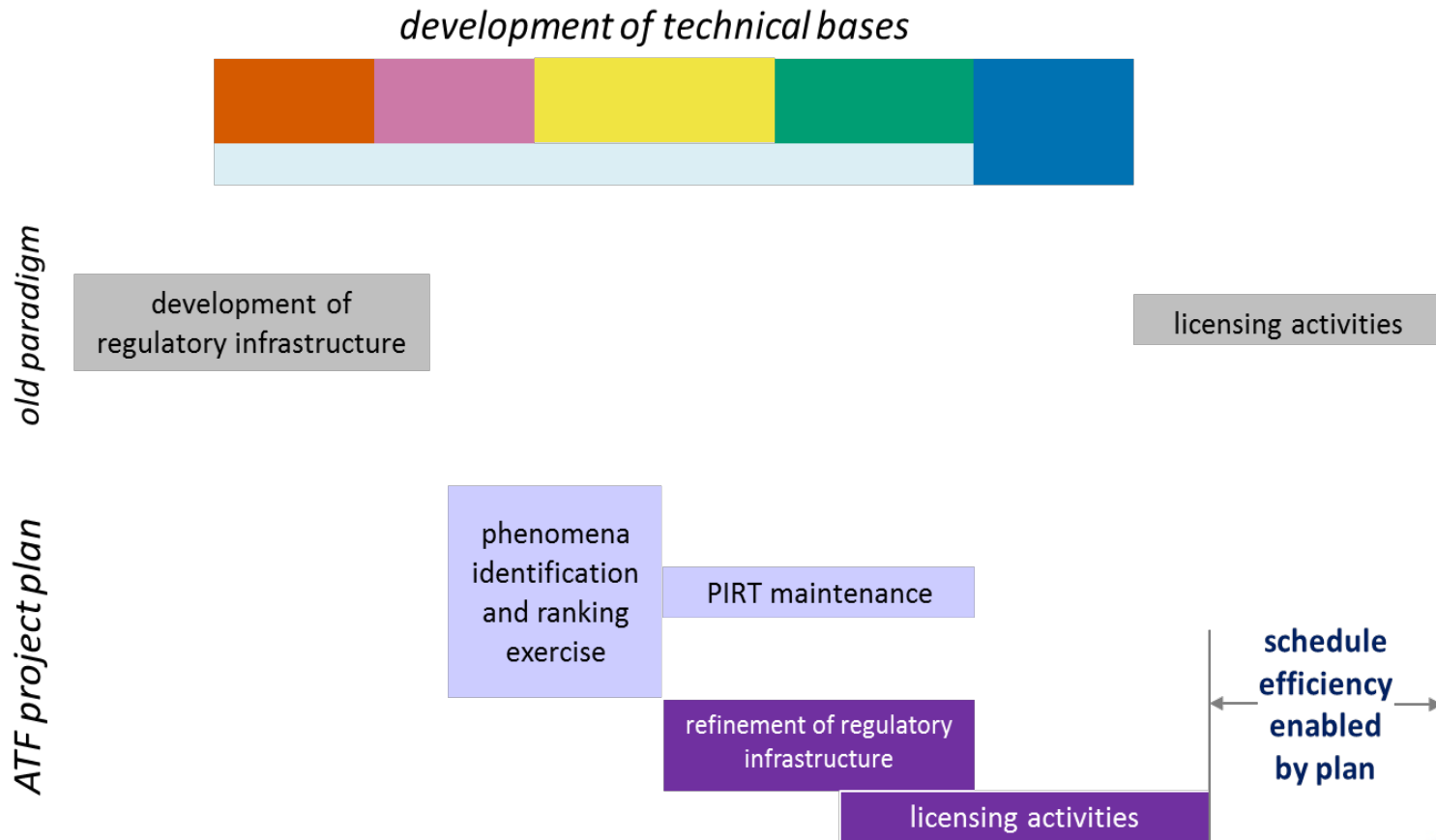
Milestone/Activity	Schedule
Complete ATF project plan.	Summer 2018
Issue final LTA guidance.	Early 2019
Conduct PIRTs and refine review infrastructure for near-term concepts.	2019–2020
Identify and implement adjustments to the regulatory infrastructure, if necessary, to enable the full potential of ATF (e.g., increase enrichment, increase burnup).	2019–2025
Conduct TR reviews for near-term concepts.	2020–2022
Conduct LAR reviews for near-term concepts.	2022–2023
Conduct LTA/TR/LAR reviews for longer term concepts.	TBD (in accordance with industry schedules)

# New Fuel Technical Basis Development





# ATF Licensing Process



# ATF PIRT Strategy

- Goal is to align early on phenomena important to safety for each ATF concept
- Varied approach based on deviation from current technology; viable options include:
  - NRC review of industry developed failure mode analysis
    - Coated claddings
  - Coordinated NRC/vendor exercise
    - Vendor technology specific ATF
  - Multi-day PIRT panel of topical experts
    - Severe accidents and transportation
- Necessary to consider full intended use of concept to ensure meaningful results and prevent re-work

# Concept-specific Licensing Roadmaps and Technology-specific Licensing Approaches

- Map of phenomena important to safety to regulatory infrastructure
- Outline the pathway for vendors to ensure technical basis meets staff's expectations
- Assessing best vehicle(s); possible examples:
  - Interim staff guidance
  - Safety review of vendor qualification plans
  - Endorsement of industry guidance

# NRC Approach to Confirmatory Analysis

- Varies based on:
  - Safety significance
  - Margin to safety limits
  - Uncertainty
- Actively enhancing NRC's computational analysis tools for near-term concepts
- Evaluating which tools are most effective and efficient for longer-term concepts

# Advanced Modelling and Simulation

- Actively engaged with DOE on potential to leverage their computational capabilities in bolstering the regulatory infrastructure for ATF reviews
- Can accelerate the development of the technical basis for ATF
  - e.g., focusing experimental programs
- Open to understand potential use of advanced M&S in ATF licensing strategies

# Regulatory Issue Summary (RIS)

- Objective of RIS questions:
  - Promote early, frequent, and robust communication between NRC and addressees
  - Inform NRC's budget and resource planning
- Recent precedent
  - Mo-99
  - Advanced reactors
- Publish draft while awaiting OMB clearance

# Public Comment Period

# Break



# III. Next Steps

- Engage directly with fuel vendors on specific ATF concepts to understand:
  - Phenomena important to safety
  - Fuel qualification plans
  - Licensing schedules
- Understand areas of margin recovery or operational flexibility which may require refinements to the regulatory infrastructure
- Immediate actions:
  - Finalize ATF project plan
  - Publish draft Regulatory Issue Summary (RIS)
- Near-term actions:
  - Compile knowledge base on all near-term concepts to prepare for expert elicitation / PIRT exercises
  - Independently review EPRI coated cladding failure modes analysis report to ensure all safety significant phenomenon are addressed
  - Schedule meetings with vendors of near-term concepts to understand draft fuel qualification plans
  - Determine appropriate vehicle for review guidance

# Public Comment Period