Action Plan for Advanced Manufacturing Technologies (AMTs)

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Overview

- Key Messages
- Meeting Objectives
- AMT Action Plan
- Information Needed

Key Messages

1. The NRC is receptive to reviewing emergent technologies and intends to efficiently and effectively disposition proposals from licensees involving AMTs

2. The current regulatory framework is sufficient for AMTs; although, staff will seek to find efficiencies in processes were appropriate

3. Reasonable assurance of adequate protection will be based on performance criteria, and safety significance

4. Early communication/coordination between the NRC, licensees, OEMs, industry groups, DOE, and stakeholders is critically important to ensure an efficient and effective review

Meeting Objectives

1. Solicited feedback/comments from stakeholders to inform the execution and/or revision of the Action Plan

2. Gain insight into licensees intent to field AMTs:
   - AMT method
   - Alloy
   - Component
   - Intended regulatory path
   - Time frame

Advanced Manufacturing Technologies

Techniques and material processing methods that have **not** been:

- traditionally used in the United States nuclear industry
- formally standardized by the nuclear industry (e.g., nuclear codes and standards, or other processes resulting in NRC approval/endorsement)

AMT Action Plan (1)

Purpose:

- Initiate the development of a strategy that will address the items in the EDO memo [1] & SECY-18-0060 [2]
- Proactively position the NRC for an efficient, effective, & transparent regulatory review of expected licensee use of AMT

Objectives:

- Identify AMTs most likely to be used for nuclear hardware
- Prepare NRC staff to review submittals
- Identify and address AMT characteristics pertinent to safety
- Provide guidance and tools for review consistency, communication, and knowledge management
- Provide transparency to stakeholders

[1] Memorandum from V.M. McCree to all NRC Staff, "Innovation and Transformation at the NRC," ADAMS Accession No. ML18004A021, January 4, 2018

[2] SECY-18-0060, Achieving Modern Risk-Informed Regulation, ADAMS Accession No. ML18110A186, May 23, 2018

AMT Action Plan (2)

Action Plan Characteristics:

- Technology neutral
- Performance-based
- Safety and reliability focused
- No new regulations or processes
- Forward looking
- Living document

High-Level Review Consideration:

- Design & Performance
- Materials & Process
- Demonstration & Data
- In-service (degradation & Inspectability)

Major Tasks (1)

Five major Tasks outlined for the next ~12 months

Task 1: Near-Term Needs

Task 2: Continuing Needs

Task 3: Determine if updated or new guidance is necessary

Task 4: Knowledge management

Task 5: Update Action Plan

Task 1: Near-Term (~6 months)

- Public meeting
- Near-term communication/interactions
- Memo identifying a candidate AMT and component
- Information gathering on candidate AMT
- Develop technical/safety document for candidate AMT
- Develop briefing materials for review of 50.59

Major Tasks (2)

Task 2: Continuing
- Continue/update select activities from Task 1
- Develop external interaction plan to leverage knowledgebase
- Develop generic technical staff resource for AMT reviews
  - Conduct public meeting to discuss content of staff resource

Task 3: NRC Guidance
- Review NRC guidance and determine if updates or revisions are needed
- Develop a memo recommending a path forward on guidance development or modification

Task 4: Knowledge Management
- Develop a Knowledge management plan

Task 5: Update Action Plan
- Evaluate the need to update plan and revise accordingly

Regulatory Paths

Non-Regulated Application

- NRC review is not required
- Experience can inform regulated applications

10 CFR 50.59 Process

- Licensee determines that NRC review/approval is not required
- Regional staff review the implementation of the 50.59 process

10 CFR 50.55a – Codes and Standards (C&S)

- NRC is a voting member for ASME Code
- Endorsed: Regulatory Guides &/or incorporated by reference

10 CFR 50.55a(z) – Alternatives to C&S Requirements

- Generic topical reports or plant specific submittals
- NRC review/approval is required

Information Needed

Application-specific

- AMT method
- Alloy
- Component
- Intended regulatory path
- Time frame

Near-term tasks focused on assumed initial AMT

Candidate Application

- Additive manufacturing
- SS 316L
- Non-Code Class
- Reactor water environment
- 10 CFR 50.59
- ~6 months

Thank You