

Advanced Manufacturing Technologies - Action Plan Status -

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Office of Nuclear Reactor Regulation
Division of Materials and License Renewal

Industry/NRC Materials Technical Exchange Meeting
NRC Headquarters, Rockville, MD
May 22, 2019

Key Messages

- Efficient and effective disposition of advanced manufacturing technology (AMT) proposals
- Current regulatory framework is sufficient for AMTs
- Reasonable assurance of adequate protection based on performance criteria and safety significance
- Early communication/coordination with stakeholders



NRC, Transformation, & AMTs

Transformation Initiative & Staff Guidance:



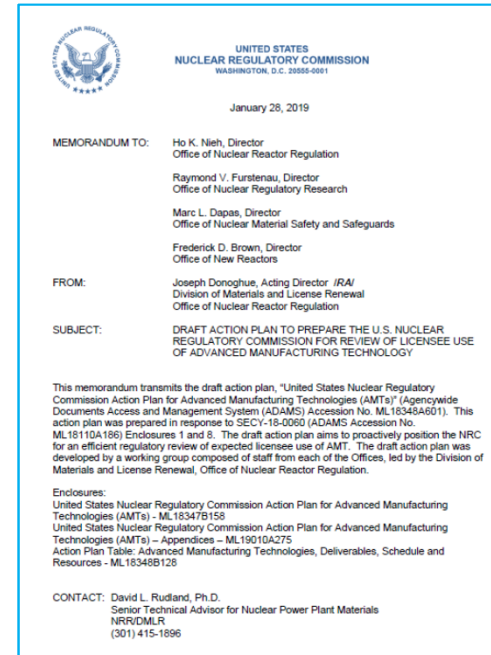
- Realize marked enhancements in NRC **effectiveness, efficiency, & agility**
- **New materials & manufacturing approaches**
- Actively **identify, encourage, & implement innovation** and transformation to advance the NRC mission
- Emphasis on **proactive posture** for new technologies

AMTs are becoming increasingly applicable to the U.S. nuclear industry and the NRC Mission

Advanced Manufacturing Technologies

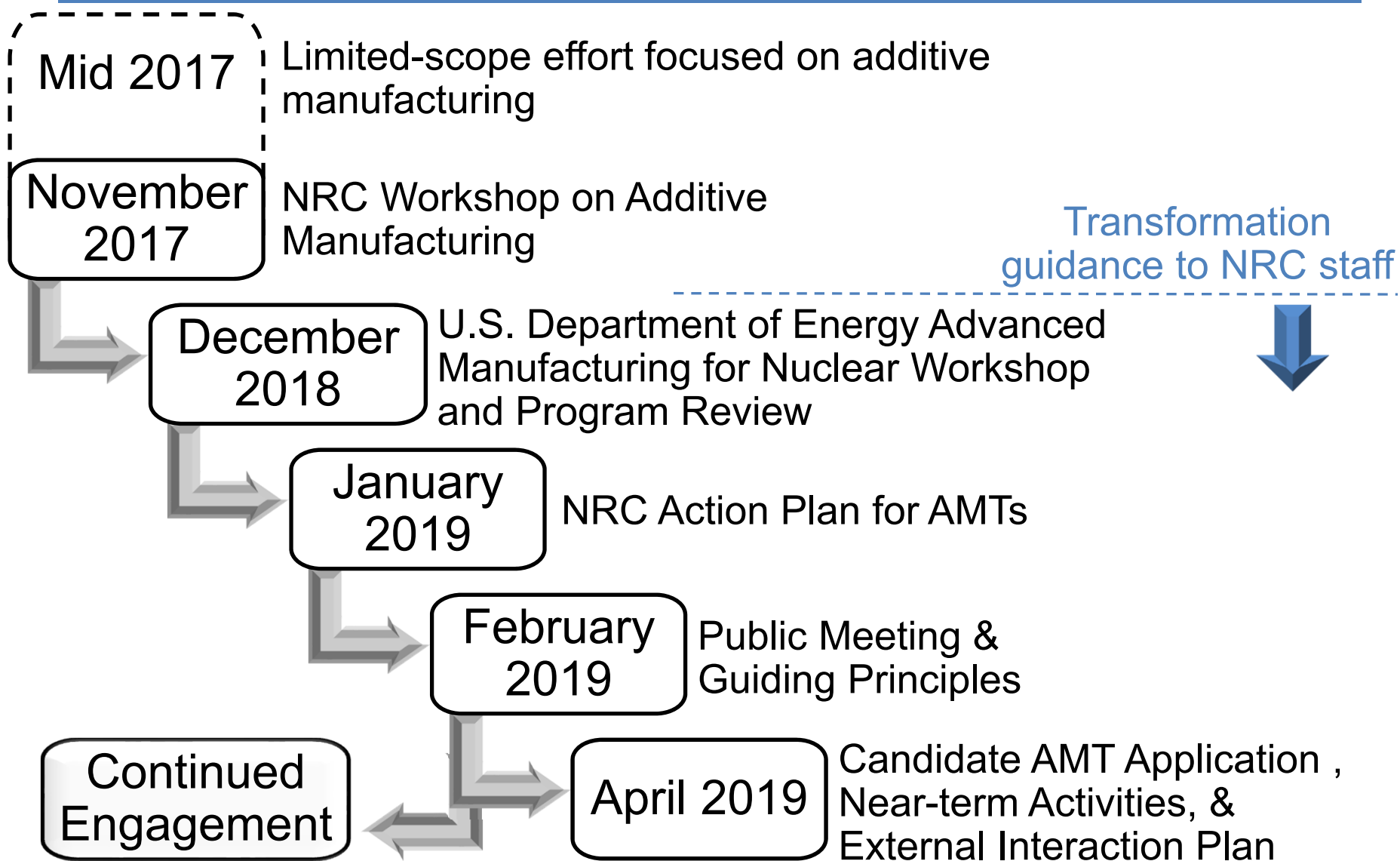
Techniques and material processing methods that have **not** been:

- traditionally used in the United States nuclear industry
- formally standardized/codified by the nuclear industry



AMT Action Plan (ADAMS ML18347B158) Objective:
Proactively position the NRC for an efficient, effective, & transparent regulatory review of licensee use of AMTs

Proactive Posture



AMT Action Plan

Five major tasks outlined over the next 12 months

Task 1: Near-Term (~6 months)

- Public meetings / communication
- Memo identifying candidate AMT
- Develop resource for review of 50.59

Task 4: Knowledge Management

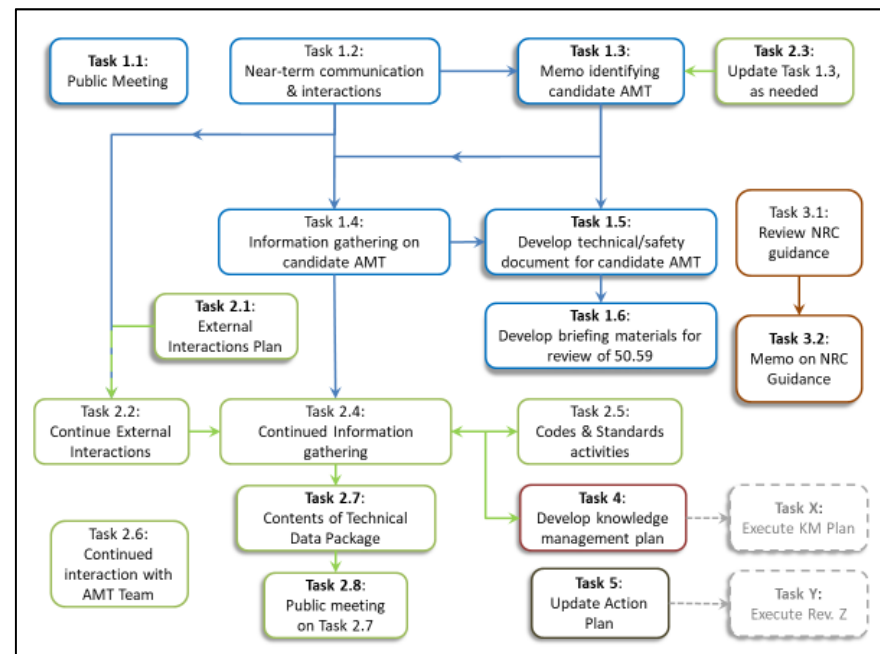
Task 5: Update Action Plan

Task 2: Continuing Activities

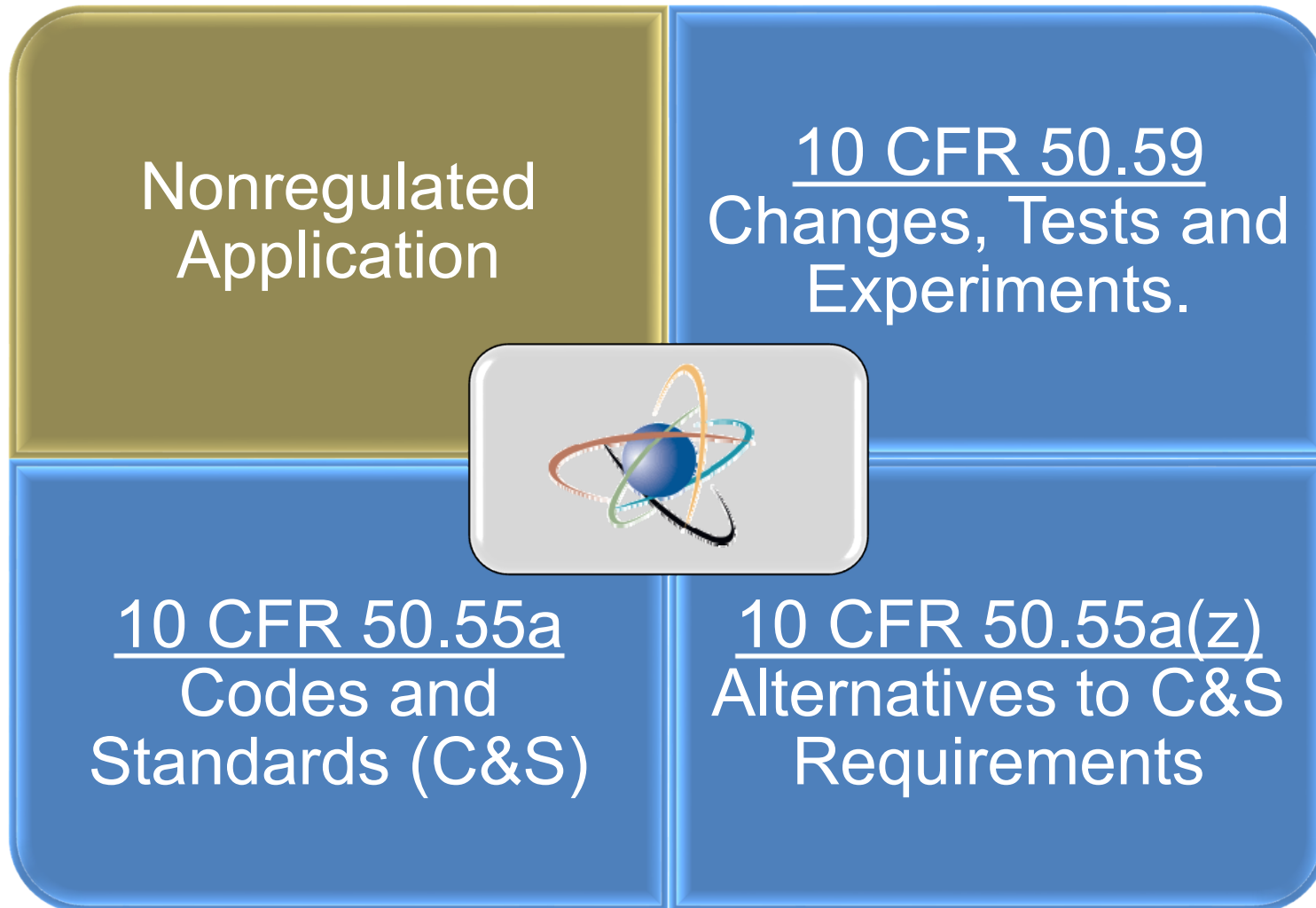
- Continue/update select activities from Task 1
- Develop plan for external interactions
- Develop generic technical guidance for AMT submittals

Task 3: NRC Guidance

- Review NRC guidance and determine if updates/revisions are needed
- Memo recommending a path forward on guidance development or modification



AMT Regulatory Paths



“Candidate AMT Application”

Thimble Plugging Device:

- Additive manufacturing
- SS 316L (wrought 304 SS)
- Non-Code class
- Reactor water environment
- 10 CFR 50.59
- Estimate ~6 months

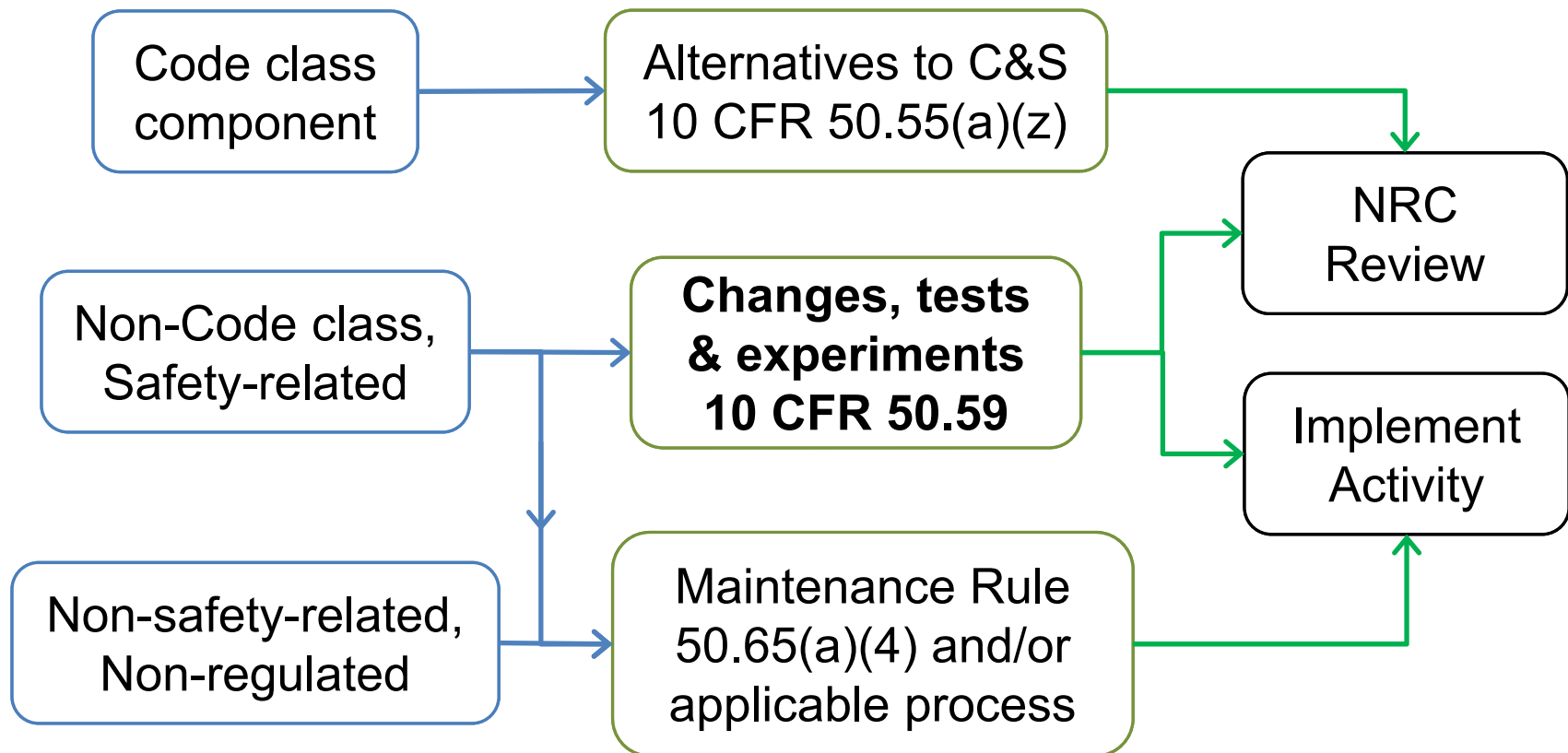


Perceived industry ranking of AMTs:

1. Laser Powder Bed Fusion (LPBF)
2. Powder Metallurgy – Hot Isostatic Pressing (PM-HIP)
3. Electron Beam (EB) Welding

NRC Review & Implementation

Assumptions: (1) Quality assurance & current requirements satisfied, (2) AMT not codified



Future Public Meetings

Planned:

- Sept. 2019 - Generic technical information needed in AMT submittals

Potential:

- AMT Action Plan, Revision 1
- NRC workshop / status meeting
- 10 CFR 50.59 applicability & unforeseen challenges
- Clarification, modification, and development of NRC guidance documents

For Implementation of AMT:

- At stakeholders' request
- Future and/or "candidate" applications



Path Forward

- Maintain alignment with the NRC Transformation Initiative
- Execute & maintain the Action Plan
- Adhere to the Guiding Principles
- Continue communication and transparency with stakeholders



Thank You

