

RIC 2025

U.S. Nuclear Regulatory Commission
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MARCH 11-13, 2025

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ADVANCE Act Section 401—Report on Advanced Methods of Manufacturing and Construction for Nuclear Energy Projects

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Section 401 Requirements

Examine

- Unique licensing issues or requirements relating to the use, for nuclear energy projects, of advanced manufacturing processes, advanced construction techniques, and rapid improvement or iterative innovation processes
- Requirements for nuclear-grade components in manufacturing and construction
- Potential use of standard materials, parts, or components in manufacturing and construction
- Potential use of standard materials to support or encapsulate new materials not covered by codes and standards
- Requirements related to the transportation of a fueled advanced nuclear reactor core from a manufacturing licensee to a licensee's site



Section 401 Requirements (cont.)

- Identify safety aspects of advanced manufacturing processes and advanced construction techniques that are not addressed by existing codes and standards
- Based on the results of the NRC's examination
 - Identify options for addressing the issues, requirements, and opportunities
 - Identify how domestic nuclear manufacturing and construction developers are impacted
- Identify the extent to which Commission action is needed for implementation
- Include cost estimates, proposed budgets, and timeframes



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Stakeholder Engagement

- External stakeholders
 - Stakeholder input collected at the following public meetings:
 - 2024 NRC Standards Forum (September 25, 2024) (ML24298A246)
 - Public Meeting on ADVANCE Act of 2024—Section 401—Advanced Methods of Manufacturing and Construction (September 30, 2024) (ML24291A083)
 - Periodic Advanced Reactor Stakeholder Meeting (October 30, 2024) (ML24355A157)
 - Received letters from the Breakthrough Institute (ML24276A206; ML24295A113), ClearPath (ML25008A073), and Nuclear Energy Institute (ML24317A080)

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NRC Response

- Report was provided to congress in January 2025 (ML24292A171)
- Identified completed, ongoing, and potential future actions to enhance efficiency in staff reviews and provide greater clarity to applicants

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Ongoing Program Activities

- Provide a paper to the Commission evaluating options for providing regulatory flexibility in 10 CFR Part 52 during construction and operational phases
- Develop design review lessons learned to improve the review process and guidance on rapid development and iterative innovation
- Develop the Advanced Reactor Construction Oversight Program
- Pre-application engagement on revision to approved topical report for steel-plate composite structures
- Develop guidance on seismic design of advanced reactors

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Potential New Program Activities

- Develop risk-informed and performance-based guidance on structural and mechanical review of components
- Develop guidance on new materials that do not yet have applicable codes and standards
- Develop guidance on accelerated material qualification
- Develop guidance on examination of novel materials
- Develop transport guidance for the use of new or nonnuclear technologies to provide greater manufacturing flexibility in package designs
- Develop guidance for structural monitoring of designs using advanced construction techniques



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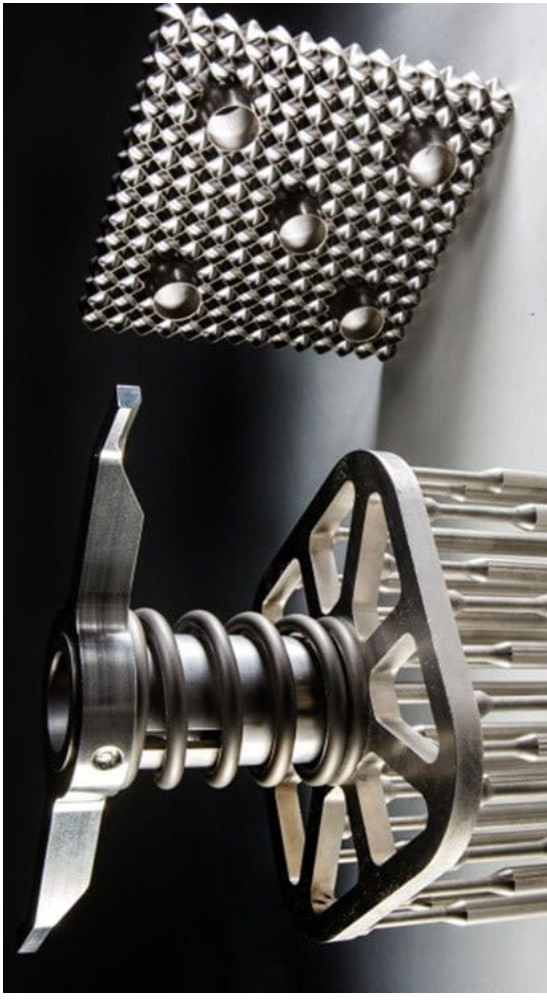
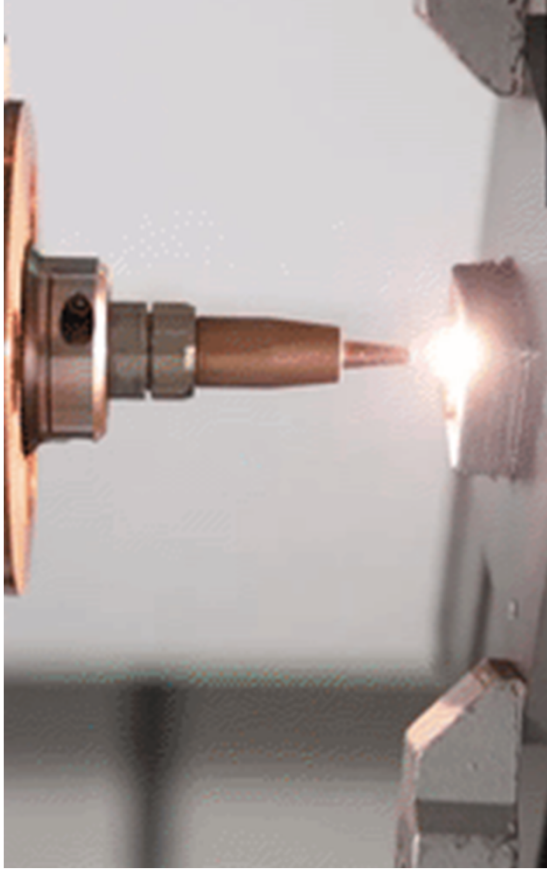
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Next Steps



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