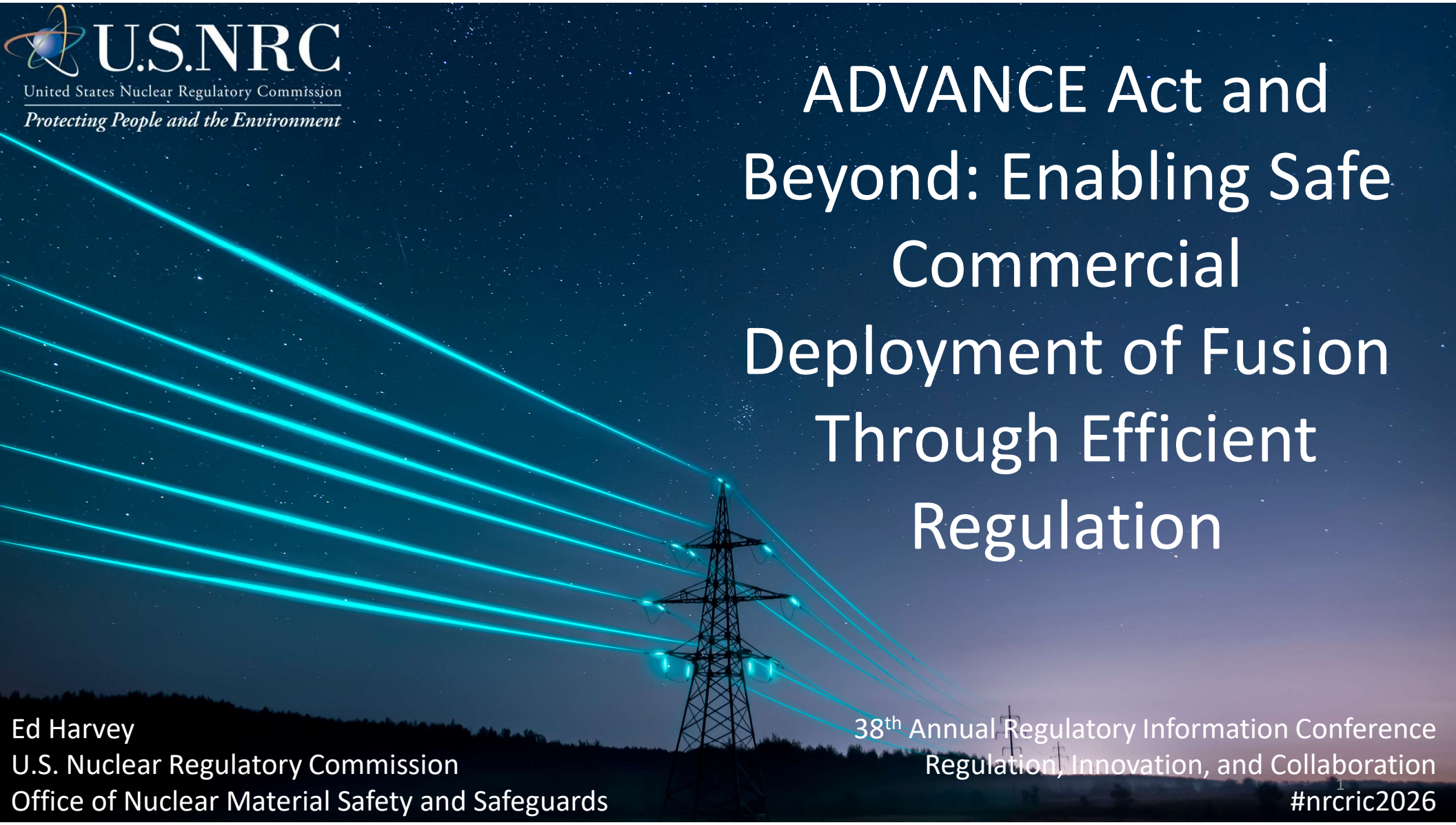


U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

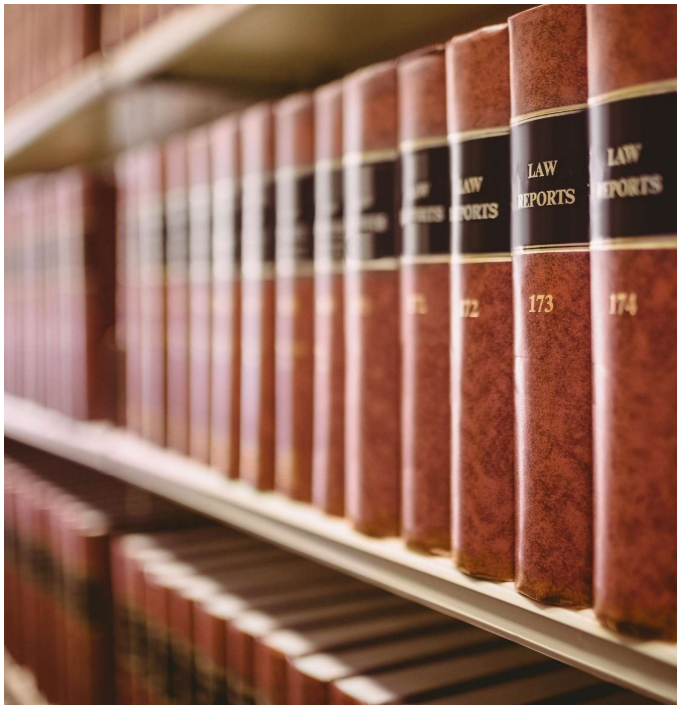
ADVANCE Act and Beyond: Enabling Safe Commercial Deployment of Fusion Through Efficient Regulation

Ed Harvey
U.S. Nuclear Regulatory Commission
Office of Nuclear Material Safety and Safeguards

38th Annual Regulatory Information Conference
Regulation, Innovation, and Collaboration
#nrcric2026

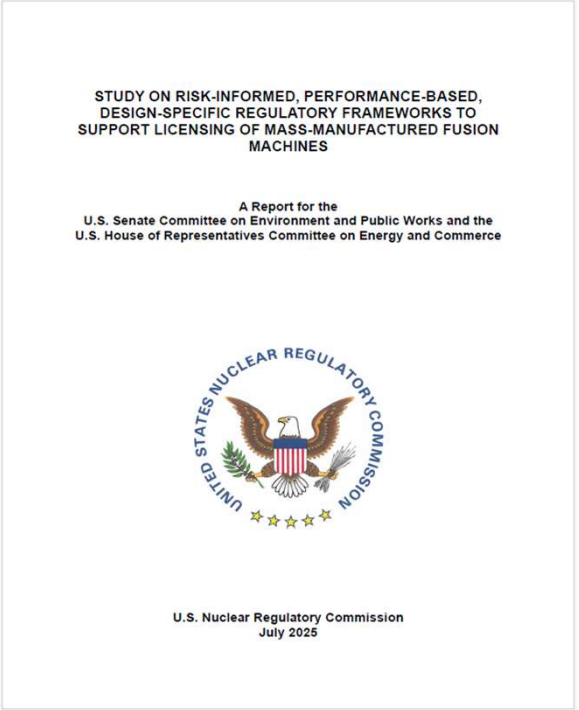
The proposed rule for fusion machines is risk informed, scalable, and provides regulatory certainty

- Limited rulemaking
- Incorporates new and revised definitions from ADVANCE Act of 2024
- Provided to NRC Commission on December 11, 2024
- EO 12866 Interagency Review
- Published in *Federal Register* (91 FR 9476) on February 26, 2026
  - Submit comments by May 27, 2026



The NRC's report to Congress sets the foundation to prepare for scaled deployment of fusion machines

- Summarizes existing external and internal certification frameworks
- Discusses the NRC's estimated timeline to issue guidance or regulations for the licensing of mass-manufactured fusion machines
- Identifies completed, ongoing, and future actions
- Discusses licensing considerations within the National Materials Program
- No specific framework is recommended or endorsed



STUDY ON RISK-INFORMED, PERFORMANCE-BASED, DESIGN-SPECIFIC REGULATORY FRAMEWORKS TO SUPPORT LICENSING OF MASS-MANUFACTURED FUSION MACHINES

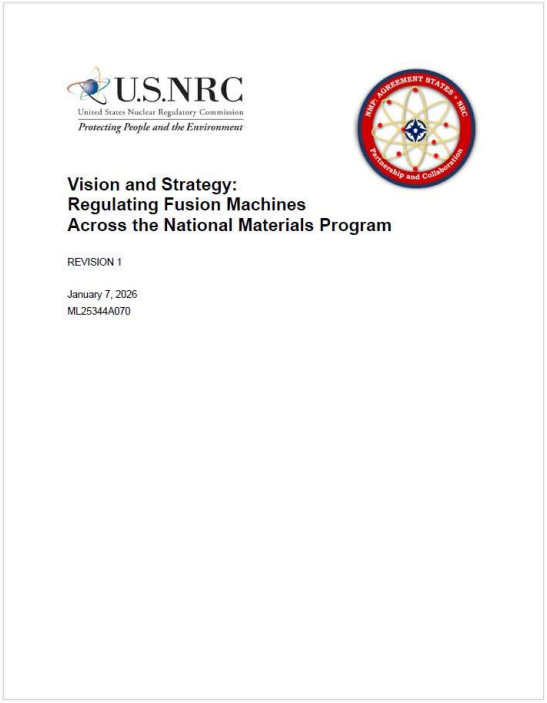
A Report for the
U.S. Senate Committee on Environment and Public Works and the
U.S. House of Representatives Committee on Energy and Commerce

U.S. Nuclear Regulatory Commission
July 2025

ML25120A080

The NRC has vision & strategy for the regulation of fusion machines that accommodates ongoing developments

- New section discussing the ADVANCE Act, the NRC's response, and the path to commercialization
- Updated list of planned actions
- New appendix: Industry Indicator Action Matrix
- New appendix: Completed Actions
- Integration of various new NRC fusion activities (e.g., standing committee, roadmap, training, etc.)
- Publicly available at ML25344A070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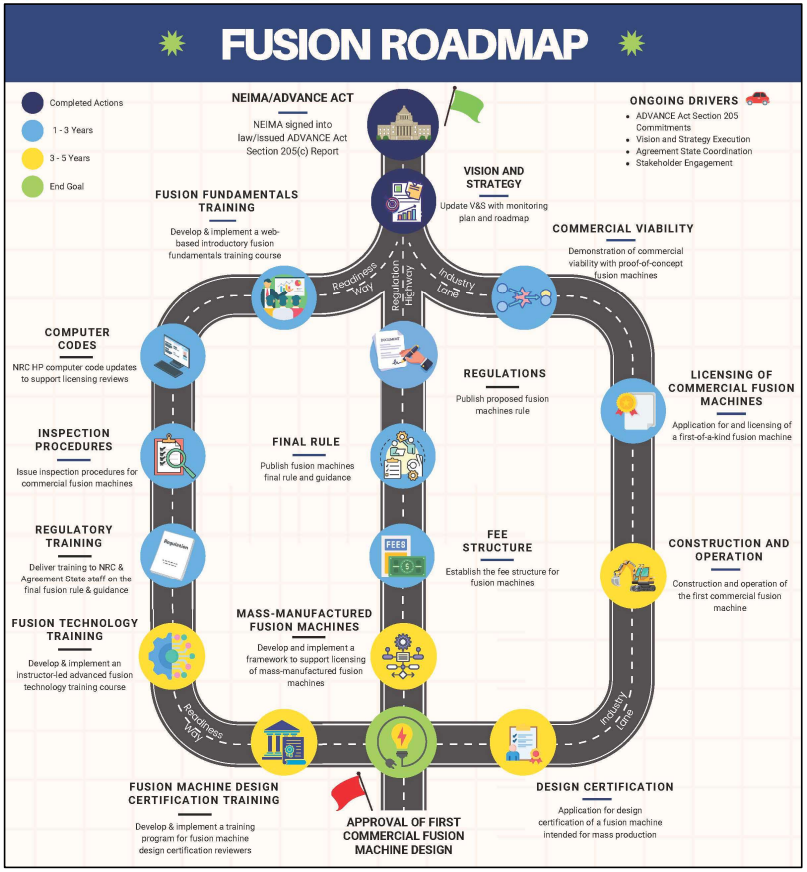
**Vision and Strategy:
Regulating Fusion Machines
Across the National Materials Program**

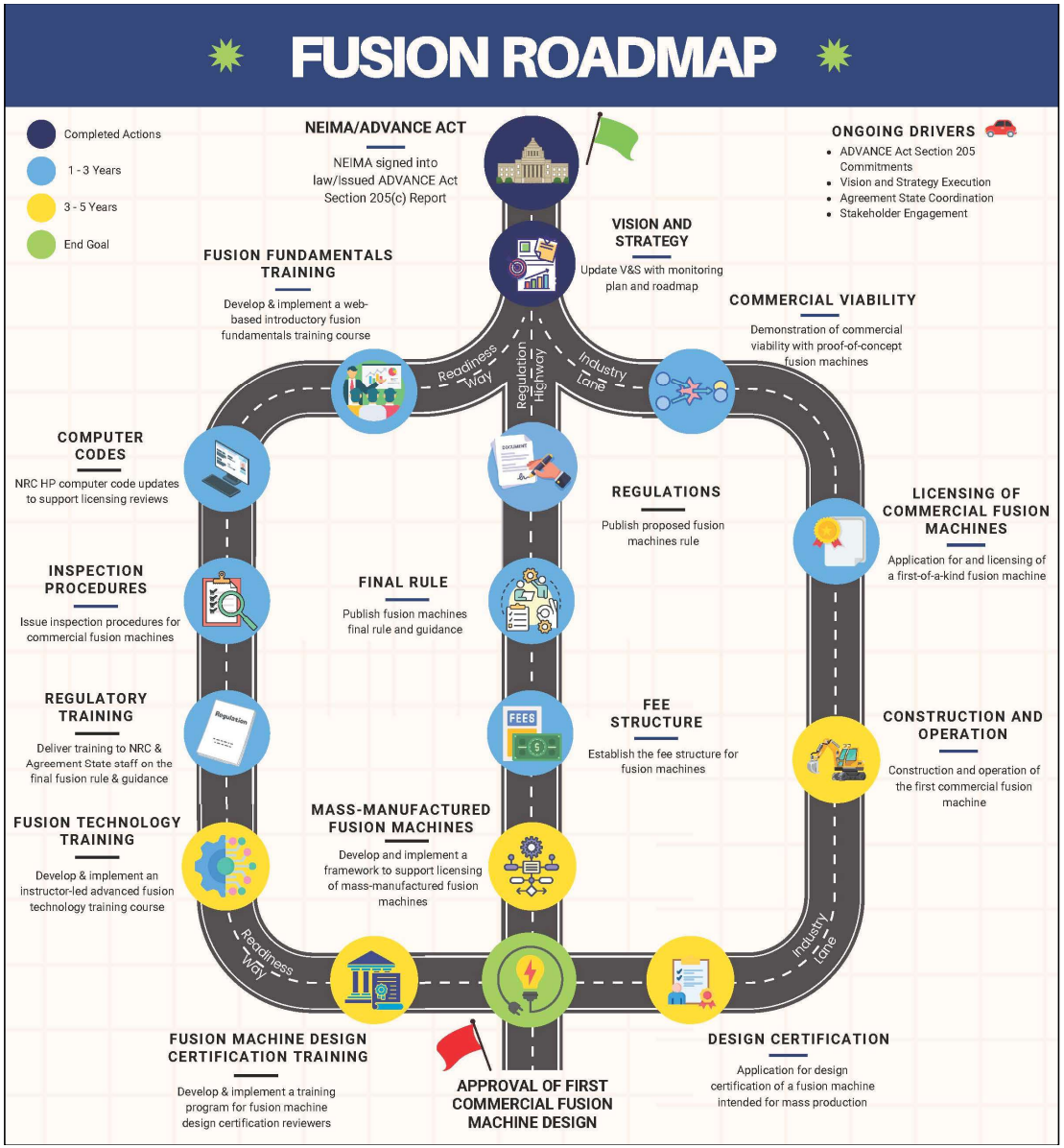
REVISION 1

January 7, 2026
ML25344A070

The Fusion Program Roadmap visually represents path to scaled commercial fusion machine deployment

- Outlines high-level milestones for:
  - Technical Readiness
  - Regulatory Preparedness
  - Industry Achievements
- Available on [NRC Fusion Website]




FUSION ROADMAP
Completed Actions
1 - 3 Years
3 - 5 Years
End Goal
NEIMA/ADVANCE ACT
NEIMA signed into law/Issued ADVANCE Act Section 205(c) Report
ONGOING DRIVERS
ADVANCE Act Section 205 Commitments
Vision and Strategy Execution
Agreement State Coordination
Stakeholder Engagement
VISION AND STRATEGY
Update V&S with monitoring plan and roadmap
FUSION FUNDAMENTALS TRAINING
Develop & implement a web-based introductory fusion fundamentals training course
COMMERCIAL VIABILITY
Demonstration of commercial viability with proof-of-concept fusion machines
Readiness Way
Regulation Highway
Industry Lane
COMPUTER CODES
NRC HP computer code updates to support licensing reviews
REGULATIONS
Publish proposed fusion machines rule
LICENSING OF COMMERCIAL FUSION MACHINES
Application for and licensing of a first-of-a-kind fusion machine
INSPECTION PROCEDURES
Issue inspection procedures for commercial fusion machines
FINAL RULE
Publish fusion machines final rule and guidance
REGULATORY TRAINING
Deliver training to NRC & Agreement State staff on the final fusion rule & guidance
FEE STRUCTURE
Establish the fee structure for fusion machines
CONSTRUCTION AND OPERATION
Construction and operation of the first commercial fusion machine
FUSION TECHNOLOGY TRAINING
Develop & implement an instructor-led advanced fusion technology training course
MASS-MANUFACTURED FUSION MACHINES
Develop and implement a framework to support licensing of mass-manufactured fusion machines
Readiness Way
Industry Lane
FUSION MACHINE DESIGN CERTIFICATION TRAINING
Develop & implement a training program for fusion machine design certification reviewers
APPROVAL OF FIRST COMMERCIAL FUSION MACHINE DESIGN
DESIGN CERTIFICATION
Application for design certification of a fusion machine intended for mass production

The Standing Committee for Fusion Machine Oversight is an essential collaboration resource

- Chartered June 30, 2025 (ML25183A025)
- Comprised of NRC HQ, Regional, and Agreement State personnel
- Serves an advisory role for fusion program development by providing input and technical assistance on:
  - Licensing and inspection issues
  - Industry progress and engagement
  - Training
  - Regulatory issues

The NRC is developing a fusion training program to ensure technical readiness for this innovative technology

- First introductory technical course launched December 2025
- Intended for NRC and Agreement State technical staff performing fusion-related duties
- Second course under development covering:
  - Fusion machine designs
  - Engineering concepts
  - Hazards

Fusion activities remain a high priority for the NRC

- Continue rulemaking
- Develop fee structure
- Implement Industry Readiness Action Plan
- Assess options for design certification
- Continued training development
- Assess modeling and computing readiness
- Continued stakeholder engagement