Draft Artificial Intelligence Strategic Plan Fiscal Years 2023-2027

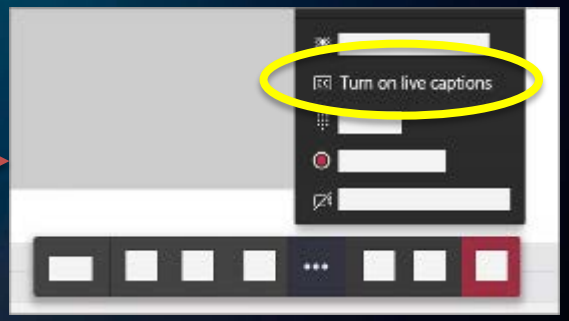
Comment-Gathering Public Meeting
August 3, 2022
1:00 p.m. – 3:00 p.m. ET

GUIDELINES AND AGENDA

Brett Klukan
NRC Meeting Facilitator

PUBLIC MEETING GUIDELINES

- The public meeting will be recorded and transcribed
- Microsoft Teams includes closed captioning
  - Select *More options (…)*
  - Select > *Turn on live captions*



- Questions and feedback
  - Following the NRC presentation, there will be an opportunity for comments and discussion from meeting attendees
- Cameras and microphones
  - Please turn off cameras and mute all microphones unless speaking

PUBLIC MEETING AGENDA

Time (Eastern)	Topic	Speaker
1:00 P.M.	Guidelines and Agenda	Brett Klukan
1:05 P.M.	Opening Remarks	Teri Lalain
1:10 P.M.	Artificial Intelligence Strategic Plan Overview	Matt Dennis
1:30 P.M.	Public Comment	Public
3:00 P.M.	Adjourn	NRC

OPENING REMARKS

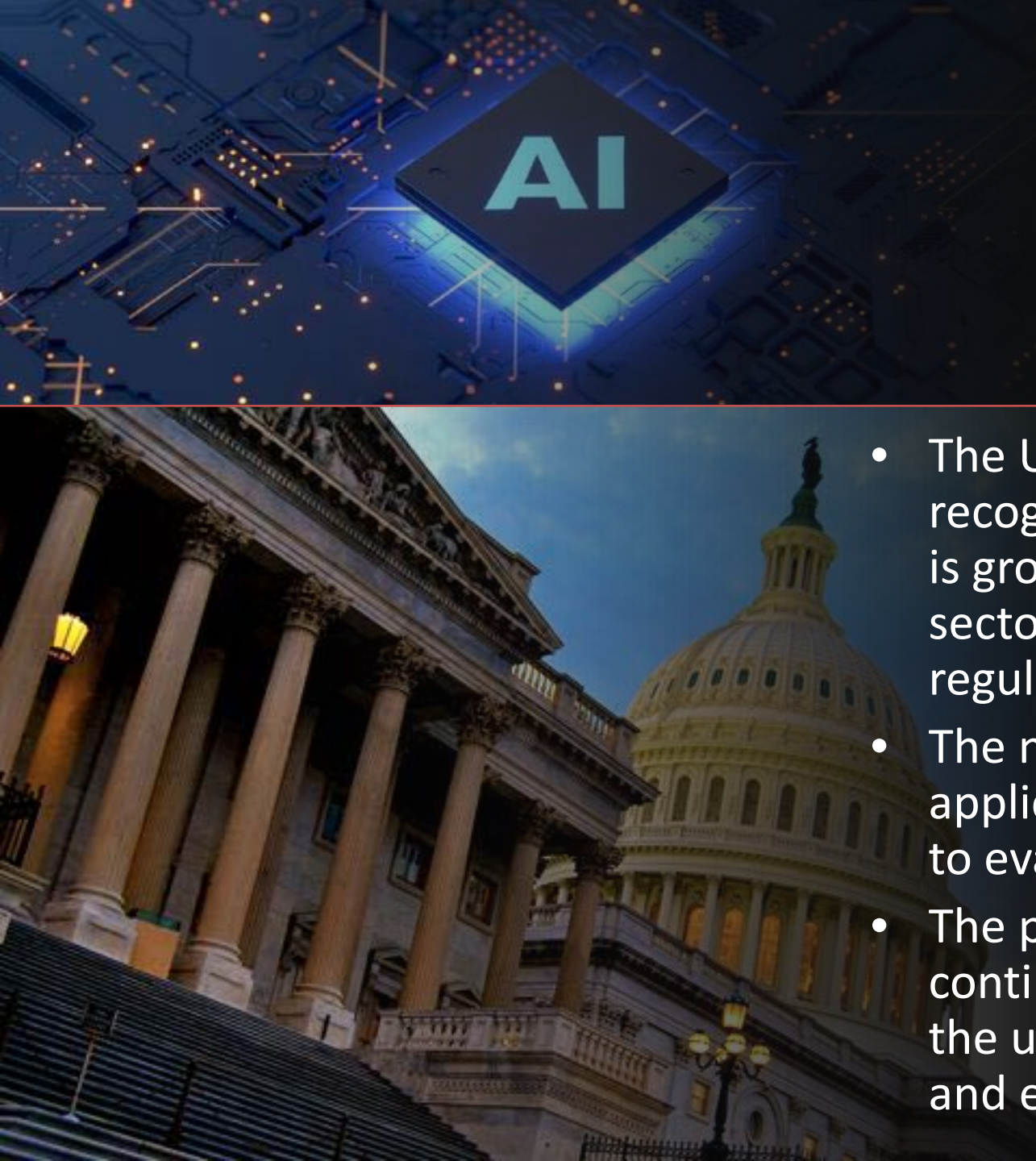
Dr. Theresa Lalain
Deputy Director, Division of Systems Analysis
Office of Nuclear Regulatory Research

OPENING REMARKS

- Purpose
- Preparation, Awareness and Readiness for the Future
- Defining Artificial Intelligence for NRC-Regulated Activities
- Common Understanding of the Levels of Autonomy
- Artificial Intelligence Strategic Plan Goals and Next Steps

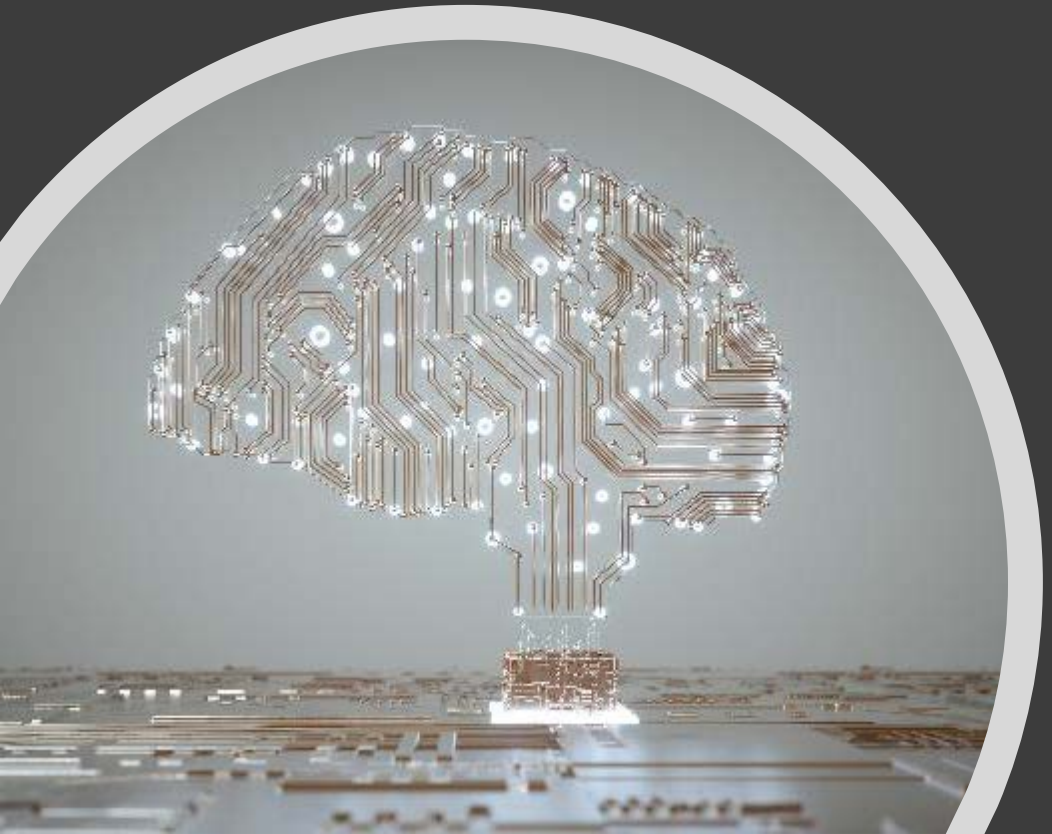
ARTIFICIAL INTELLIGENCE STRATEGIC PLAN OVERVIEW

Matt Dennis
Reactor Systems Engineer (Data Scientist)
Division of Systems Analysis
Office of Nuclear Regulatory Research



PURPOSE

- The U.S. Nuclear Regulatory Commission (NRC) recognizes that interest in artificial intelligence (AI) is growing rapidly in both the public and private sectors and anticipates increased use of AI in NRC-regulated activities
- The nuclear industry is researching and using AI applications; therefore, the NRC must be prepared to evaluate the technology
- The purpose of the AI Strategic Plan is to ensure continued staff readiness to review and evaluate the use of AI in NRC-regulated activities effectively and efficiently



ACHIEVING A COMMON UNDERSTANDING OF THE TERM AI

- **Artificial Intelligence (AI)**
  - A machine-based system that can go beyond defined results and scenarios and has the ability to emulate human-like perception, cognition, planning, learning, communication, or physical action. For a given set of human-defined objectives, AI can make predictions, recommendations, or decisions influencing real or virtual environments. These systems use machine- and human-based inputs to perceive real and virtual environments, abstract such perceptions into models through analysis in an automated manner, and use model inference to formulate options for information or action.[1]
- **Machine Learning (ML)**
  - An application of artificial intelligence that is characterized by providing systems the ability to automatically learn and improve on the basis of data or experience, without being explicitly programmed.[1]

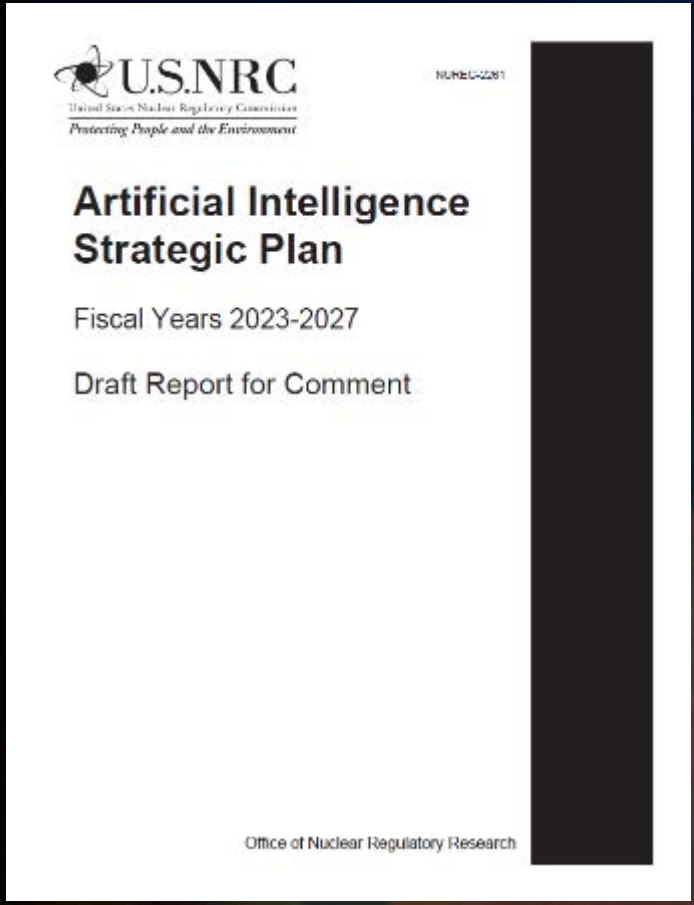
[1]Adapted from National Defense Authorization Act (2021)

Preparation, Awareness, and Readiness for the Future

- Developing the AI Strategic Plan to better position the agency in AI decisionmaking
- Engaged interdisciplinary team of AI subject matter experts across the agency
- Leveraging insights from the 2021 Data Science and AI Regulatory Applications Workshops*
- AI Strategic Plan to be finalized after receipt and consideration of comments from the public and feedback from the Advisory Committee on Reactor Safeguards

*Available at https://www.nrc.gov/public-involve/conference-symposia/data-science-ai-reg-workshops.html

ARTIFICIAL INTELLIGENCE STRATEGIC PLAN GOALS



The AI Strategic Plan* consists of five strategic goals:

- **Goal 1: Ensure NRC Readiness for Regulatory Decisionmaking**
- **Goal 2: Establish an Organizational Framework to Review AI Applications**
- **Goal 3: Strengthen and Expand AI Partnerships**
- **Goal 4: Cultivate an AI-Proficient Workforce**
- **Goal 5: Pursue Use Cases to Build an AI Foundation Across the NRC**

* Available at ML22175A206

Notional AI and Autonomy Levels in Commercial Nuclear Activities

Human Involvement

Level	Notional AI and Autonomy Levels	Potential Uses of AI and Autonomy in Commercial Nuclear Activities
Level 1	**Insight** Human decisionmaking assisted by a machine	AI integration in systems is used for optimization, operational guidance, or business process automation that would not affect plant safety/security and control
Level 2	**Collaboration** Human decisionmaking augmented by a machine	AI integration in systems where algorithms make recommendations that could affect plant safety/security and control are vetted and carried out by a human decisionmaker
Level 3	**Operation** Machine decisionmaking supervised by a human	AI and autonomy integration in systems where algorithms make decisions and conduct operations with human oversight that could affect plant safety/security and control
Level 4	**Fully Autonomous** Machine decisionmaking with no human intervention	Fully autonomous AI in systems where the algorithm is responsible for operation, control, and intelligent adaptation without reliance on human intervention or oversight that could affect plant safety/security and control

Machine Independence

Common Understanding of the Level Key for Regulatory Readiness

ARTIFICIAL INTELLIGENCE STRATEGIC PLAN NEXT STEPS

Timeframe	Milestone
July 5, 2022	Issued Draft AI Strategic Plan for public comment
August 3, 2022	Host AI Strategic Plan public meeting
November 2022	Advisory Committee on Reactor Safeguards Joint Subcommittee meeting on AI
Spring 2023	Issue Final AI Strategic Plan

Maintaining public engagement and awareness via our NRC AI Public Website*

*Available at https://www.nrc.gov/about-nrc/plans-performance/artificial-intelligence.html

PUBLIC COMMENT QUESTIONS

1. Are there any specific recommendations or improvements to consider in the development of the AI Strategic Plan?

2. What goals, objectives, or strategies within the NRC's current strategic plan should be added, enhanced, or modified in the AI Strategic Plan?

3. What are potential near-term, or far-term, AI activities that the NRC should be aware when finalizing and prioritizing the AI Strategic Plan, or associated supporting research?

4. What are potential challenges the NRC should be aware when preparing to review potential use of AI in nuclear applications?

Contact Us

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Public Meeting
Draft Artificial Intelligence Strategic Plan for FY 2023-2027

August 3, 2022

- **The public comment portion of today's meeting was scheduled from 1:30 p.m. – 3:00 p.m.**
- **If you have joined and have comments, please e-mail the following NRC staff, and we will rejoin the meeting to receive your comments:**
  - **Matt Dennis** (matthew.dennis@nrc.gov)
  - **Luis Betancourt** (luis.betancourt@nrc.gov)