

Nuclear Industry Virtual Assistant (NIVA) Pilot Project

Visionary Update Advancing Secure, Federated AI for the Nuclear Sector

Robert Austin, EPRI

US NRC AI Symposium

March 12, 2026

NOTE– all screenshots represent UNVERIFIED OUTPUT



All Images Produced by Copilot

Project Vision & Objectives



Secure Platform

Develop a secure, federated AI platform tailored for the nuclear industry

Enhanced Operations

Enhance knowledge retrieval, decision support, and safety compliance



IP Protection

Demonstrate data sharing with IP protection and regulatory compliance

Collaboration

Foster collaboration across utilities, members, and vendors



Governance & Collaboration

Organizational Structure:



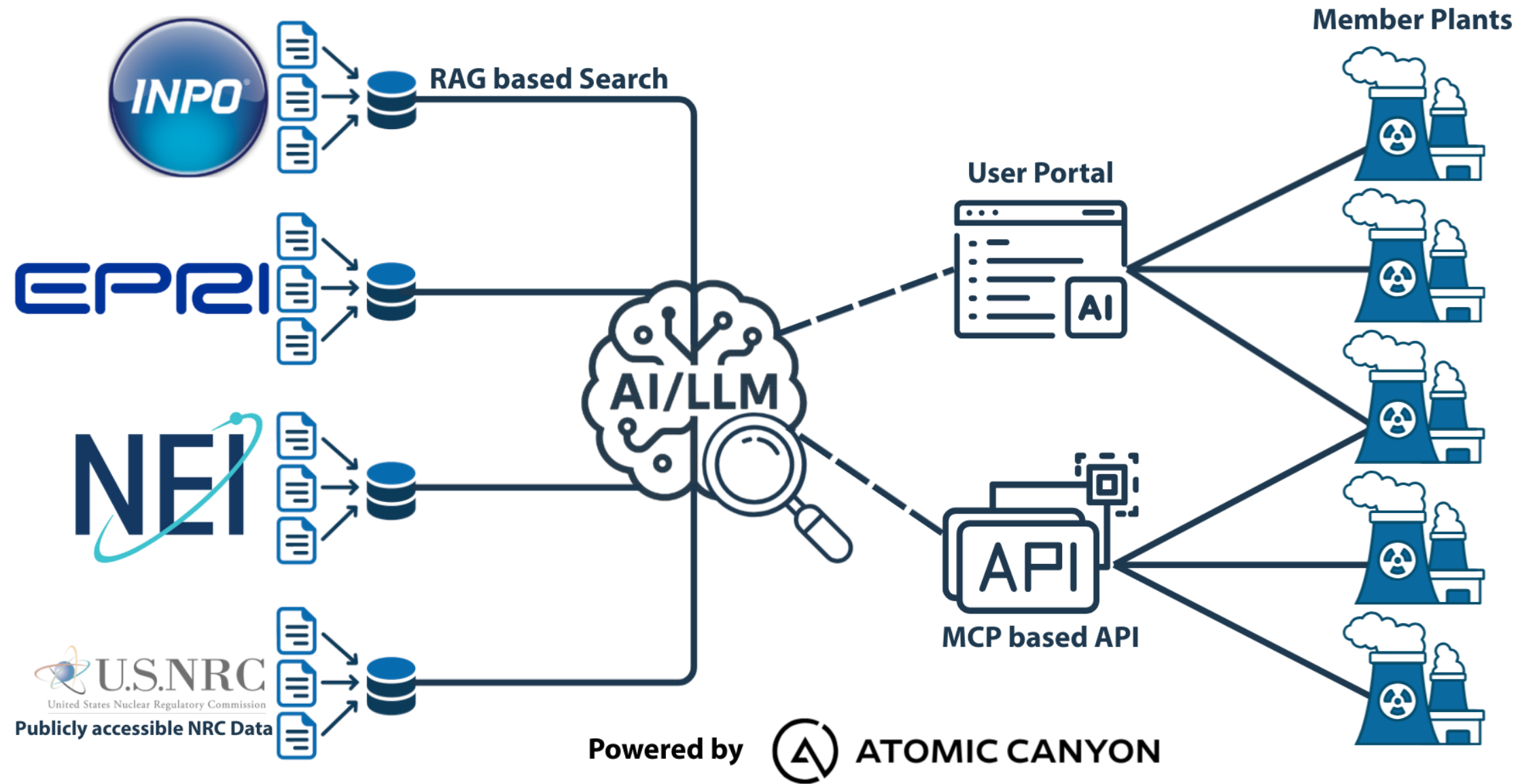
Oversight Committee:

- INPO •EPRI •Constellation •NEI
- PG&E •Southern •OPG •NextEra

Project Management Approach:

- Weekly technical syncs
- Agile project management via Monday.com
- Partner organizations maintain data sovereignty and infrastructure

Proposed Architecture Diagram



RAG – Retrieval Augmented Generation
MCP – Model Context Protocol
API – Application Programming Interface



Initial Use Cases & Scope

Knowledge Transfer (led by NEI)

- Supports knowledge management and transfer by enabling overview and detailed understanding of key topics in the nuclear industry

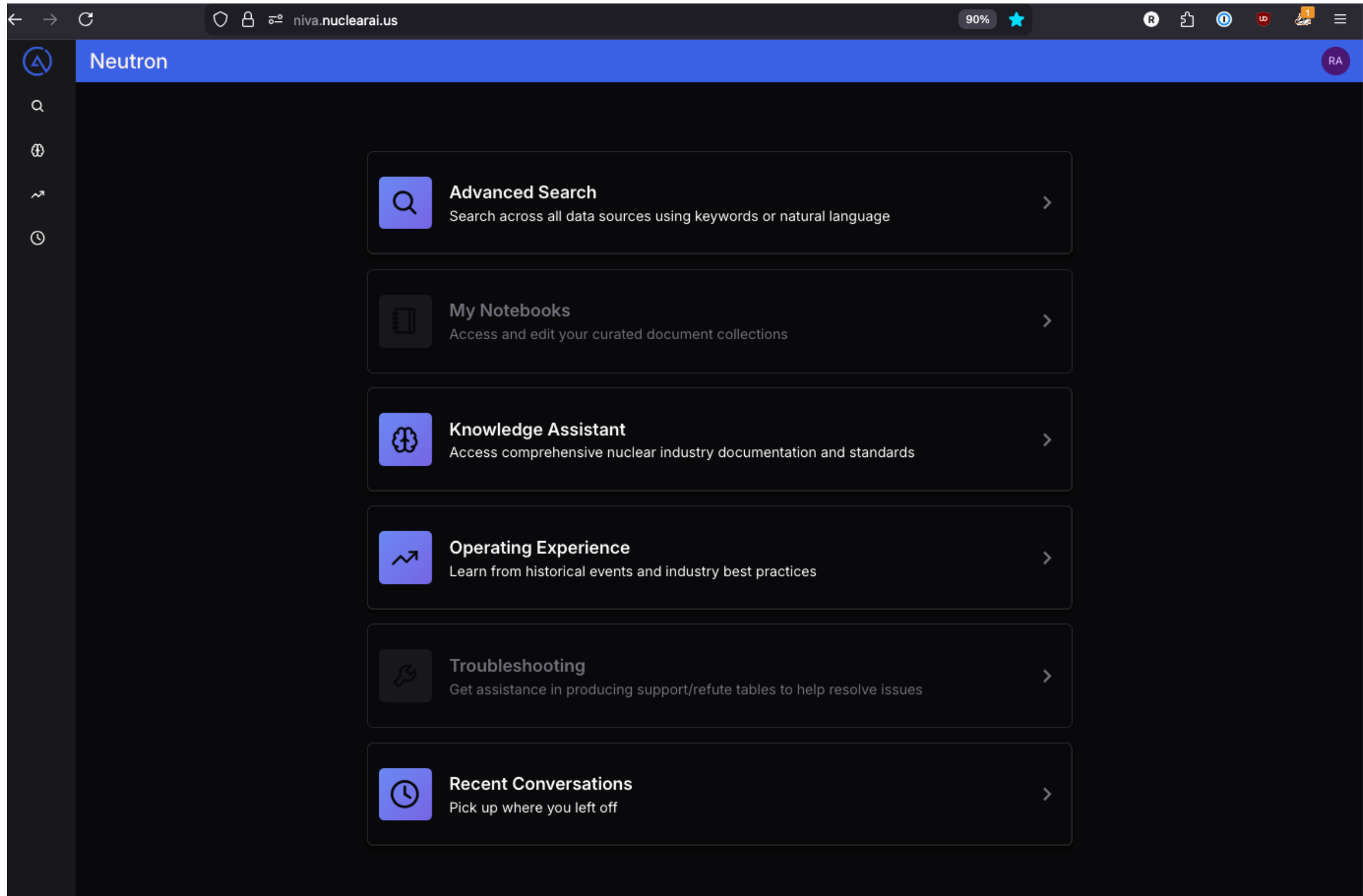
Operational Experience Search (led by INPO)

- Smart search across IRIS, INPO, EPRI, and NEI documents
- Supports plant reliability and safety initiatives

Troubleshooting (led by EPRI)

- AI-assisted plans for degraded components or system conditions

Landing Page (Requires INPO login & special provision for pilot)





Nuclear Knowledge Assistant

Search across thousands of technical reports, industry standards, and guidance documents to solve problems and enhance decision-making.



Select Data Sources



Ask Your Question



Get AI-Powered Insights

Choose Your Data Sources

NRC Regulatory (Complete)

Regulatory Guides + All NUREG types

✓ Available

[Learn about NUREG types](#)

NRC Regulatory (Core)

Regulatory Guides + NUREG & NUREG/KM only

✓ Available

[Learn about NUREG types](#)

Nuclear Energy Institute

Technical Guides

✓ Available

Institute of Nuclear Power Operations

Member Library

✓ Available

Electric Power Research Institute

Technical Guides

✓ Available

What would you like to research?

Try these examples:

How do you develop safety culture?

Give me a 101 lesson on FLEX strategies

What topics should I cover for a lesson on digital I&C upgrades?

What research has the US NRC done on AI?





US NRC research on AI

📄 New Chat



What research has the US NRC done on AI?



Thought for 116s



Overview

The U.S. Nuclear Regulatory Commission (NRC) has conducted research on artificial intelligence (AI) through a multi-year strategic plan to prepare for the integration and regulation of AI in NRC-regulated activities. This research emphasizes understanding AI applications' safety, reliability, and regulatory implications and ensuring the organization has the capacity to evaluate and use AI effectively. This includes developing frameworks, workforce training, partnerships, and projects for the broader application of AI in the nuclear regulatory framework.

Context

The NRC developed its "Artificial Intelligence Strategic Plan (Fiscal Years 2023–2027)" with the aim of enabling the agency to respond effectively to the growing interest and potential applications of AI within the nuclear energy industry. Notably, the initiative aligns with broader government directives on advancing trustworthy AI in regulatory contexts, though the NRC, as an independent agency, follows its own tailored implementation plans.

Detailed Explanation

The NRC's AI research primarily aligns with five strategic goals in its forward-looking AI Strategic Plan:

- 1. Ensure NRC Readiness for Regulatory Decision-Making:** Research includes exploring critical AI technical considerations such as explainability, robustness, trustworthiness, and bias. Regulatory readiness will address gaps in standards and the development of best practices for evaluating AI technologies' safety and reliability
NUREG , NUREG .
- 2. Establish an Organizational Framework to Review AI Applications:** The NRC has created internal AI governance structures such as the AI Steering Committee (AISC) and the AI Community of Practice (AICOP). These ensure coordinated efforts and knowledge sharing as part of its preparation to regulate AI technologies that licensees may adopt
NUREG , NUREG .
- 3. Strengthen and Expand AI Partnerships:** Recognizing the complexity of AI technologies, the NRC collaborates with other federal agencies, international regulators, academia, and standards-development organizations to leverage expertise, identify gaps, and inform research priorities
NUREG , NUREG .
- 4. Cultivate an AI-Proficient Workforce:** Research efforts extend to workforce development, including providing training on machine learning, deep learning, and data analytics. These activities help build the technical skills needed to understand and regulate AI applications in nuclear contexts
NUREG , NUREG .

Ask anything



Context

The NRC developed its "Artificial Intelligence Strategic Plan (Fiscal Years 2023–2027)" with the aim of enabling the agency to respond effectively to the growing interest and potential applications of AI within the nuclear energy industry. Notably, the initiative aligns with broader government directives on advancing trustworthy AI in regulatory contexts, though the NRC, as an independent agency, follows its own tailored implementation plans.

Artificial Intelligence Strategic Plan: Fiscal Years 2023-2027 (NUREG-2261) - Artificial Intelligence Strategic Plan (FY 2023-2027) Public Comment Resolution Table (PDF – 814 KB)

35 pages • ML23037A840

[click to preview](#)

gaps in standards and the development

NUREG

NUREG

with five strategic goals in its forward-looking AI Strategic Plan:

AI Decision-Making: Research includes exploring critical AI technical robustness, trustworthiness, and bias. Regulatory readiness will address development of best practices for evaluating AI technologies' safety and reliability

2. Establish an Organizational Framework to Review AI Applications: The NRC has created internal AI governance structures such as the AI Steering Committee (AISC) and the AI Community of Practice (AICOP). These ensure coordinated efforts and knowledge sharing as part of its preparation to regulate AI technologies that licensees

Summary

The NRC has actively engaged in research on AI primarily to establish readiness for regulating its nuclear sector applications. This work includes preparing frameworks, developing training programs, advancing collaborative partnerships, and assessing technical considerations like trustworthiness and explainability. Research activities have been highlighted in reports such as NUREG-2261 and NUREG/CR-7294. Efforts are ongoing to set a robust foundation for AI applications in NRC-regulated activities and to align with industry advancements and strategic goals.

Sources ▾



Continue Exploring

Describe how the NRC ensures data quality and quantity for AI applications.

Outline specific AI methodologies or tools being explored under the NRC's Future-Focused Research Program.

List the technical considerations that the NRC assesses when reviewing AI technologies for safety and reliability.

Provide examples of NRC collaborations with international organizations for AI standards development.

Draft a short non-technical email explaining what the US NRC has done to my Chief Nuclear Officer.
Less than 150 words.



Draft a short non-technical email explaining what the US NRC has done to my Chief Nuclear Officer. Less than 150 words.

Subject: Overview of NRC Activities on AI

Dear [Chief Nuclear Officer's Name],

The NRC has been proactively researching artificial intelligence (AI) to ensure readiness for its integration into regulated nuclear activities. They've developed a multi-year Artificial Intelligence Strategic Plan (FY 2023–2027) focusing on regulatory decision-making for AI applications, such as predictive maintenance and reactor systems. Their efforts include workforce training, partnerships with other regulators and organizations, and establishing evaluation frameworks for AI technologies.

Additionally, they've published research, including NUREG/CR-7294, which explores AI's role in operating nuclear plants, and are addressing key challenges like trustworthiness, explainability, and bias. This strategy positions the NRC to regulate AI effectively while supporting innovation in the nuclear industry.

Let me know if you'd like more details or specific reports related to their efforts.

Best regards,

[Your Name]



Add any potential gaps in US NRC AI coverage to the email.

Subject: Overview of NRC Activities on AI

Dear [Chief Nuclear Officer's Name],

The NRC has taken significant steps to prepare for the integration of artificial intelligence (AI) in regulated activities through its Artificial Intelligence Strategic Plan (FY 2023–2027). This includes developing regulatory frameworks for AI applications like predictive maintenance, training their workforce, building partnerships, and addressing challenges such as trustworthiness and bias. They've also issued research like NUREG/CR-7294, which explores AI use in nuclear plant operations, to understand its potential impacts.

However, there are some gaps in their current approach. Specific regulatory standards for AI are still under development, and details on how they will evaluate and approve industry AI applications remain unclear. Additionally, some information on internal testing and datasets for assessing AI is not available, potentially slowing progress. These areas may require close industry collaboration moving forward.

Let me know if you'd like further details or specific reports.

Best regards,
[Your Name]



Operating Experience Assistant

Learn from historical events and industry best practices

- 1 Task
- 2 Details
- 3 Sources

What are you trying to do?

Select the type of task you're working on so we can optimize your search results.



Issue Response

Something happened, search for similar events across the industry



Training & Pre-Job Preparation

Find examples and lessons for briefings or training



Change Evaluation Screening

Evaluate OE before making a change

Coming Soon



General Research

Discover patterns, monitor performance, or explore a topic

Coming Soon

Back

Continue



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Project Milestones

Date / Phase	Milestone Description
Q1/Q2 2026	Pilot Documentation, Training & Pilot Wrap-Up
Q2 2026	Troubleshooting Module & Security Implementation
Q2/Q3 2026	Project Completion & Full System Deployment
Completed Project Milestones	
Q1 2026	Knowledge Assistant with EPRI Documents OE Module
Q3 2025	Technical Alignment Workshop
Q3 2025	Portal MVP Delivery Requirements Gathering

Pilot will determine costs for full production version

Questions & Contact Information

We welcome your questions and look forward to discussing the future of AI in the nuclear industry. Please reach out to the following points of contact for more information:

Points of Contact:

- **EPRI:** Rob Austin, raustin@epri.com
- **NEI:** Jim Slider, jes@nei.org
- **INPO:** Ramon Martinez, martinezr@inpo.org