ORGANIZATION of AGREEMENT STATES (OAS) and CONFERENCE of RADIATION CONTROL PROGRAM DIRECTORS (CRCPD)

BOARD BRIEFING to the COMMISSIONERS of the U.S. NRC

10/8/2024

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Common Priorities Across the State Organizations

Agenda:

Lisa Bruedigan, CRCPD Chairperson (TX) – Communications – Strong and Growing

Steve Seeger, OAS Champion (TN) – Fusion Regulatory Framework

Rikki Waller, CRCPD Past-Chair (ID) – Artificial Intelligence

Keisha Cornelius, OAS Past-Chair (OK) – IMPEP Process Improvements

Pat Mulligan, CRCPD Chair-Elect (NJ) – Emerging Reactor Technology

Sarah Sanderlin, OAS Chair-Elect (NJ) – Training

COMMUNICATIONS – STRONG AND GROWING STRONGER

LISA BRUEDIGAN (TX) - CRCPD

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COMMUNICATIONS

As the National Materials Program has grown, so has the commitment to communications.

- G2G meetings
- Champions Chats
- Integrated working groups
- Integrated IMPEP's

AI generated – regulators communicating – Adobe Firefly

Recent Examples

Industrial Radiographers

NSTS request to consider reducing the number of OJT hours

Call between NRC and Texas

- Reviewed background – What is counted for OJT?
- Texas confirmed
- Explained that Illinois, Oklahoma, and Louisiana follow same requirements
- Proposal would align the country

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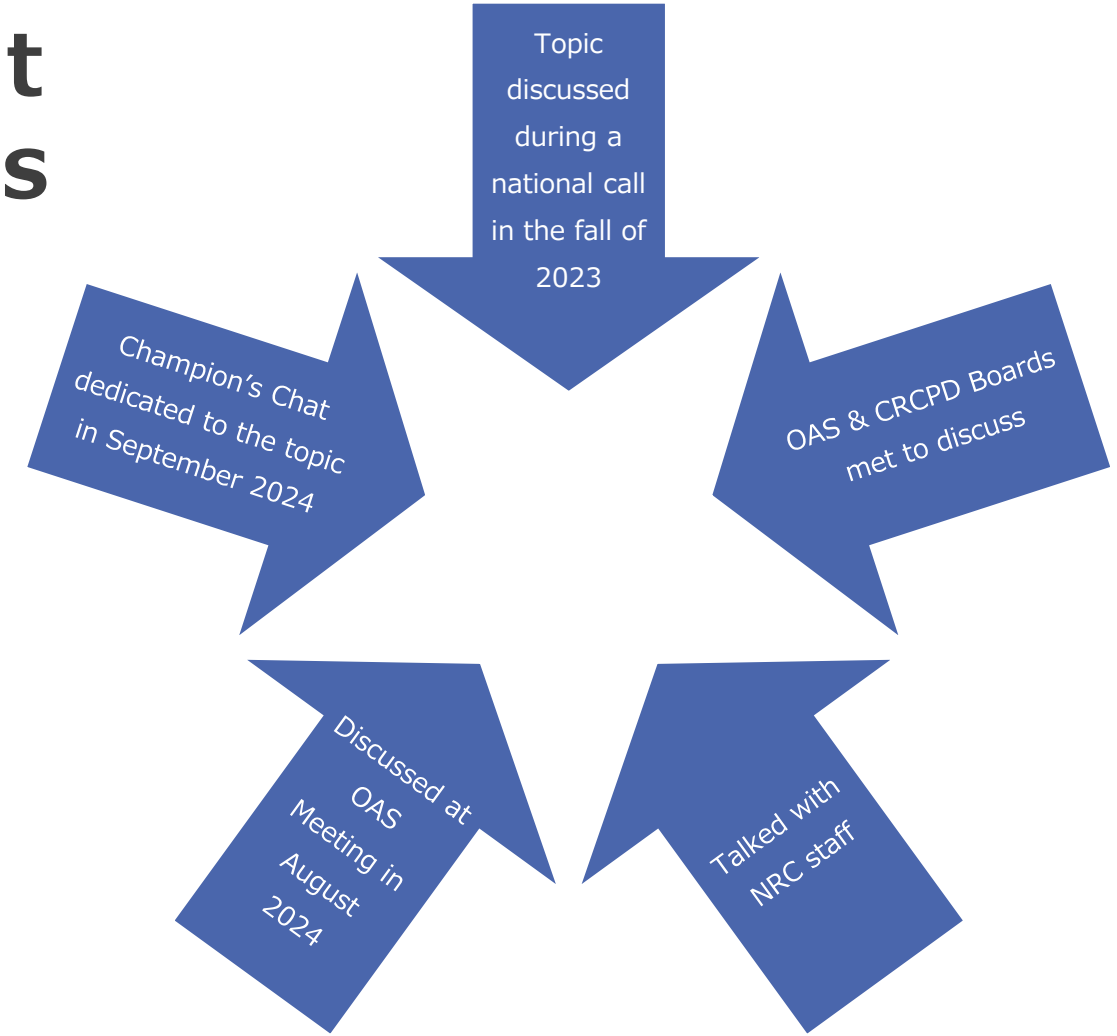
RECENT EXAMPLES

- Industrial Radiography Two-man rule
- Request submitted by Texas many years ago
- TX Program changed their opinion
- Didn’t know we could withdraw the request

RECENT EXAMPLES

Exempt Devices



AI generated – professionals sharing ideas to improve radiation safety across the world – Adobe Firefly

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AI generated – partnerships – spring – radiation symbol - Adobe Firefly

NEW AND ONGOING TOPICS

- Continued interactions
- Early notifications about issues with significant impacts
- Updates on the Advances Act
- Annual SLO meeting
- Continued attendance at CRCPD and OAS Annual Meetings and Board

improve radiation safety across the world – Adobe Firefly

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Future Interactions

G2G Meeting

Champions Chats

Requests for Comments

Individual Interactions

Combinations

FUSION REGULATORY FRAMEWORK

STEVE SEEGER, PREVIOUS CHAIR (TN) - OAS

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The NRC and Agreement States function as regulatory partners and work together on:

- DEVELOPMENT OF REGULATORY GUIDES AND PROCEDURES
- DEVELOPMENT OF REGULATIONS
- INTEGRATED MATERIAL PERFORMANCE EVALUATION PROGRAM (IMPEP)
- THE NRC WILL LEVERAGE THIS EXPERIENCE AND WORK WITH ALL AGREEMENT STATES TO DEVELOP A COMPREHENSIVE FRAMEWORK FOR REGULATION OF FUSION MACHINES.

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GOALS FOR FUSION:

Consistency and Competency Across the National Materials Program

Current Workings and Dialog

- Current Working Groups
- Draft NUREG & Rules Comments
- Champions Chats
- Sessions During Conferences
- Communication, Communication, and more communication


WHAT IS LEFT TO DO AND HOW DO WE GET TO THE FINISH LINE???

CREATION OF TRAINING COURSES

- **Technical Training**
  - Fusion Technology
  - Commercial power
- **Licensing Training**
- **Inspection Training**

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CREATE A GROUP OF SUBJECT MATTER EXPERTS

- Made up of representatives from states already working to regulate fusion.
- Group can help create standards for licensing and inspections.
- As new states find fusion is coming to their state, they can reach out for help from this group.

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EXPLORING NEW IDEAS WITH AI

RIKKI WALLER (ID) - CRCPD

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The use of AI has grown by leaps and bounds in just the past 18 months. Web browsers and cell phone even come with AI capabilities.

How can AI be used to assist the state programs?

- AI can assist state programs by optimizing the delivery of public benefits, ensuring equitable access, and enhancing customer support through automated systems.
- In radioactive material inspections, AI can enhance the detection and identification of materials by processing data from radiation detection systems.
- For inspection preparation, AI can improve accuracy and efficiency through visual inspection tools that automate defect detection and quality control processes.

How can AI be used in inspection prep?

- AI can greatly assist with the preparation for radioactive material inspections by streamlining various tasks and ensuring thoroughness. Here are some ways AI can help:

- Data Collection and Analysis: AI can gather and analyze historical inspection data to identify common issues and areas that need special attention. This helps in creating a focused inspection plan.

- Risk Assessment: AI algorithms can assess the risk levels of different sites based on various factors such as past incidents, current radiation levels, and environmental conditions. This allows inspectors to prioritize high-risk areas.

- Checklists and Protocols: AI can generate customized checklists and protocols based on the specific requirements of each inspection site. This ensures that all necessary steps are covered, and nothing is overlooked.

- Training and Simulation: AI-driven simulations can provide inspectors with virtual training scenarios, helping them to practice and prepare for real-life inspections. This improves their readiness and response capabilities.

- Scheduling: AI can help in scheduling inspections by considering factors like inspector availability, site accessibility, and urgency of the inspection. This ensures efficient use of time and resources.

- Documentation: AI can assist in preparing all necessary documentation and reports required for the inspection, ensuring compliance with regulatory standards.

How will the states' licensees use AI?

- Licensees can use AI to streamline operations, analyze vast amounts of data, and support decision-making processes, while also considering ethical use, legal compliance, and IP rights.

- AI can assist in automated radiation monitoring and detection, predictive maintenance and data analysis and reporting.

- It can also be a valuable asset for the training of staff. AI-driven simulations can provide realistic training scenarios for staff, improving their preparedness and response capabilities[1].

1 iaea.org

Preparing for New Challenges

- Regulatory Compliance: Ensure that AI systems comply with existing regulations and standards. This may involve updating regulatory frameworks to accommodate new AI technologies.
- Data Security and Privacy: Implement robust data security measures to protect sensitive information processed by AI systems.
- Training and Education: Provide training for staff on how to use AI tools effectively and understand their limitations.
- Ethical Considerations: Develop guidelines to address ethical concerns related to AI, such as bias in decision-making and transparency of AI algorithms.

- Infrastructure and Investment: Invest in the necessary infrastructure to support AI technologies, including hardware, software, and skilled personnel.
- Collaboration with Experts: Work with AI experts and industry leaders to stay updated on the latest advancements and best practices.
- By proactively addressing these challenges, licensees can leverage AI to improve their operations while ensuring safety and compliance.

- To prepare for the challenges of AI, states can implement rigorous auditing, training, and continuous monitoring to ensure fairness and integrity in program administration.

- It is crucial to balance innovation with fiscal responsibility, ensuring AI implementations prioritize cost savings and efficiency without compromising human oversight.

- As AI continues to evolve, ongoing education and policy development will be essential to address the ethical, legal, and technical challenges associated with its use in various sectors.

IMPEP PROCESS IMPROVEMENTS

KEISHA CORNELIUS, PAST CHAIR (OK) - OAS

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RECOMMENDATIONS FROM THE WORKING GROUP TO ASSESS NMP PERFORMANCE

Working group was asked to

`• Assess whether the current IMPEP process provides proactive assessment of NMP radiation control program's performance

• Make recommendations (2 categories)

- Enhance Awareness of RCP Performance
- Improving the IMPEP assessment of a RCPs performance

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Enhancing Awareness of Radiation Control Program's Performance

- *Recommendation #1. Identify and implement meaningful performance metrics to track the health of the NMP.*
  - Discontinue use of CBJ metric NM-23, "Percentage of Materials Programs with More Than One Unsatisfactory Performance Indicator." Create a new CBJ metric. Sponsor an NRC/OAS Working Group to evaluate if developing NMP metric is beneficial.
  - Identify performance tracking tools in addition to the Annual Report to the Commission.

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Enhancing Awareness of Radiation Control Program's Performance

- *Recommendation #2: Develop tools and strategies for identifying potential performance issues and facilitating prompt corrective actions.*
  - Continue to support the NMP through monthly NMP calls, Champions Chats. Continue to support the NMP through the OAS Annual Meeting
  - Assist the Agreement States/OAS with the creation of a pamphlet for new Radiation Control Program Directors (RCPDs). Develop an IMPEP Awareness Training for new RCPDs.
  - Facilitate a counterpart meeting for all NMP inspectors. Facilitate regular NMP meetings for Agreement State license reviewers and inspectors.
  - Establish a joint working group to develop a self-audit tool. Encourage the use of a self-audit tool to focus discussions and refine the periodic meeting agenda.
  - Consider conducting an assessment of the RSAO role.

Enhancing Awareness of Radiation Control Program's Performance

- *Recommendation #3: Develop NMP strategies to assist RCPs with performance challenges.*
  - The working group recommends that management consider revising the Programmatic Technical Assistance section of SA-1001, Implementation of Management Directive 5.7, "Technical Assistance to Agreement States."

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Improving the IMPEP Assessment of a Radiation Control Program's Performance

- *Recommendation #4: Modify and enhance IMPEP to ensure that reviews continue to be done in a consistent and risk-informed manner.*
  - Consider evaluating all RCPs under the same common performance indicators and establish a joint working group to implement this action
  - Enhance Team Leader training to include more scenarios. Establish quarterly or semi-annual team leader forums.
  - Include additional training on report writing and how to deliver a high-level brief for exits and MRB meeting, periodically

Improving the IMPEP Assessment of a Radiation Control Program's Performance

- *Recommendation #5: Modify IMPEP processes to increase efficiencies. In addition to creating consistency in the implementation of IMPEP*
  - Identify, and if possible, resolve, impediments to having Agreement State IMPEP Team Members become qualified to review LROPE.
  - Revise the MRB script to guide the discussion to the challenging performance indicators. Consider grouping all clearly satisfactory indicators into one short discussion so that the remainder of the time can be focused on those indicators that are less that satisfactory.
  - Encourage MRB members to provide questions to the IMPEP team prior to MRB meeting and with enough lead time for the IMPEP team members to be able to provide quality answers.

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NEW REACTOR TECHNOLOGY DESIGN APPROVAL

PAT MULLIGAN (NJ) - CRCPD

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New Reactor Technology Design Approval Process

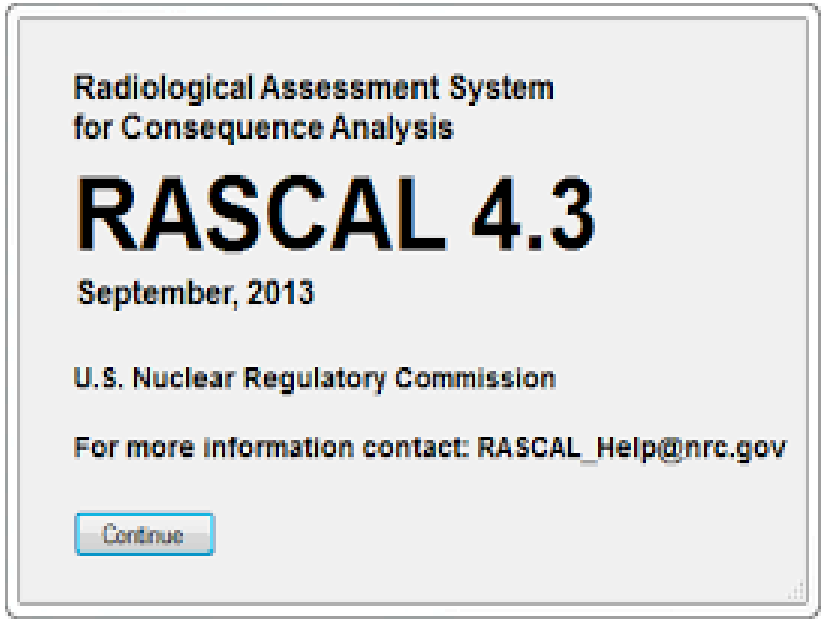
- Globally, the initiatives for carbon reduction remain aggressive.
- State and federal climate change goals include significant reductions in carbon emissions by 2030 and major reductions by 2050 reach “net zero”.
- To reach these goals, subject matter experts agree that nuclear power needs to be part of the energy portfolio
- Industry leaders expect that energy production from nuclear will at least double or possibly even triple over the next 30 years.

Emerging Reactor Technology

- Small Modular Reactors (SMRs)
- Fusion Reactors
- Generation IV Reactors
  - Sodium-Cooled Fast Reactors (SFRs)
  - Lead-Cooled Fast Reactors (LFRs)
  - Molten Salt Reactors (MSRs)
  - Gas-Cooled Fast Reactors (GFRs):
- High-Temperature Reactors (HTRs)

NRC Role in Emerging Reactor Technology

- The NRC (U.S. Nuclear Regulatory Commission) plays a critical role in the technical review of reactor design to ensure the safe and reliable operation of all nuclear generating stations.
- This rigorous NRC oversight process ensures that nuclear reactors operate safely and effectively, minimizing risks to public health and the environment.
- State and local government agencies rely on the technical expertise of the NRC to fully evaluate reactor designs, to perform rigorous severe accident consequence analysis and provide dose assessment models for offsite response agencies to use for accident assessment.



Nuclear Energy Institute – Emerging Technology

NEI is a trade organization representing the nuclear energy industry.

NEI's Mission:

- To promote the benefits of nuclear energy.

- Advocate for policies that support the safe and efficient use of nuclear power.

Nuclear Energy Institute – Emerging Technology

- NEI's goal is to petition the NRC to streamline the regulatory review process and reduce the time required to review and approve new reactor designs.
- NEI also engages with international regulatory bodies to harmonize standards and practices for regulatory practices globally.

CRCPD Perspective

- State agencies are 100% reliant on the technical experts at NRC to evaluate the safety of new reactor designs.
- While states do not oppose looking for opportunities for increasing efficiencies in the process, any streamlining cannot reduce the rigorous attention to detail that the NRC has demonstrated for previous reactor designs.
- States are confident that any approved designs will be well understood from a safety perspective and that accident sequences are also well understood and defined as they are for current technologies.

AGREEMENT STATE TRAINING

SARAH SANDERLIN (NJ) - OAS

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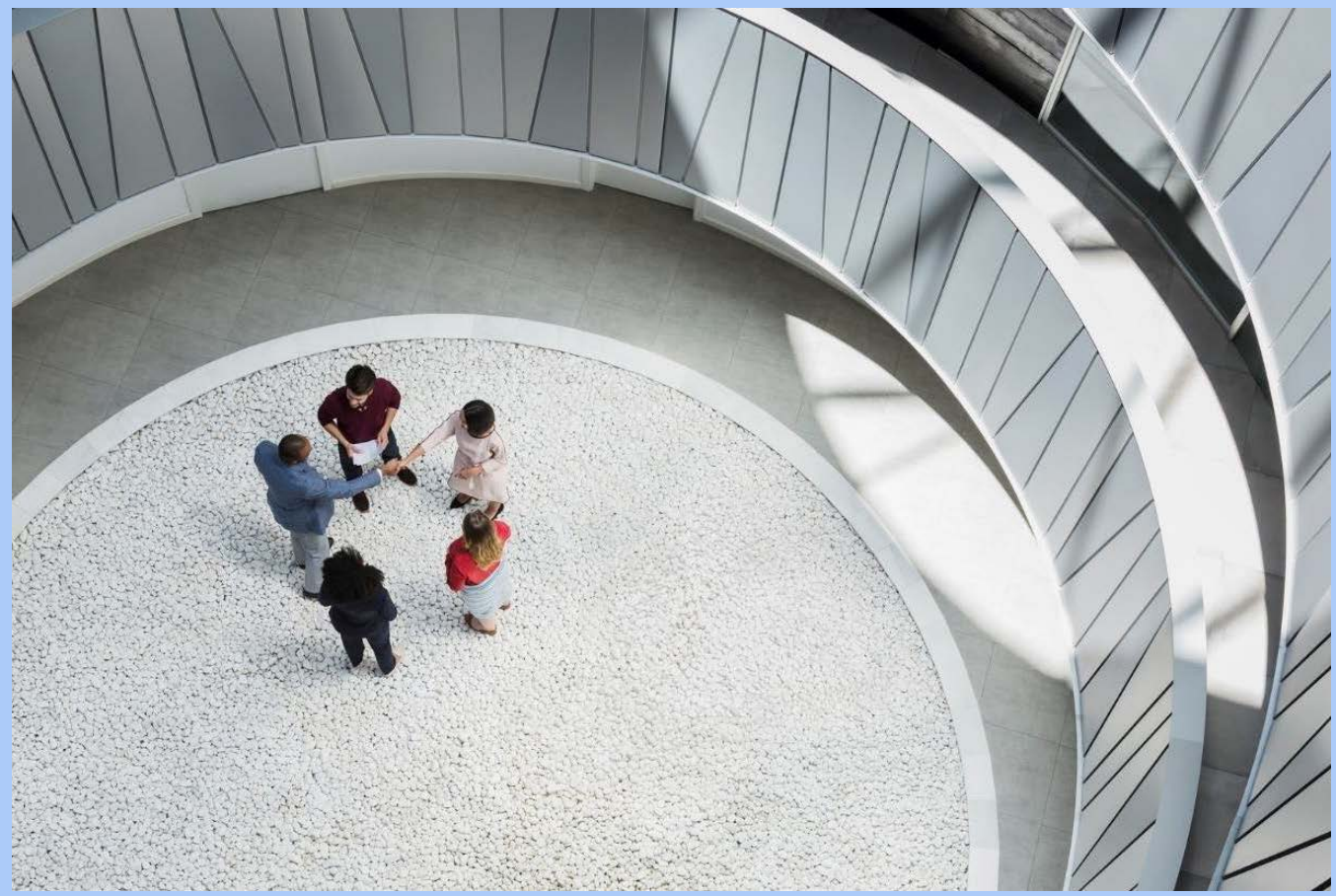
FORMATS OF TRAINING

- In person with the NRC
- State Hosted
- State Delivered
- Virtual – instructor led
- Self-Study - CLE



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CURRENT ISSUES

- Funding to attend training in other states when NRC training is not available
- Virtual/self-study courses
    - Lack of hands-on experience, knowledge transfer, opportunity for open discussion

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WHAT OAS WOULD LIKE TO SEE HAPPEN

- NRC's commitment to fund and support training moving forward

- Funding for Agreement State staff to attend State delivered training

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Coordination continues

US NRC - CRCPD - OAS

Thank you for your continued coordination across the National Materials Program and in radiation protection.

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

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QUESTIONS?