Organization of Agreement States (OAS) and Conference of Radiation Control Program Directors (CRCPD)

Board Briefing
to the
Commissioners of the
U.S. NRC

05/18/2023

CRCPD

Common Priorities across the State Organizations

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Patrick Mulligan, Past Chair (NJ) – CRCPD Initiatives and Accomplishments

Jeff Semancik, Past Chair (CT) - Workforce Development and Resource Sharing Initiative

Rikki Waller, Chair (ID) – Future Collaborative Efforts

OAS

Steve Seeger, Chair (TN) - Future of the National Materials Program

Augustinus (Auggie) Ong, Past Chair (NH) – Fusion and Other New Technologies

Keisha Cornelius, Chair Elect (OK) – Rulemaking and Policy

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National Materials Program (NMP):

Updates and Activities

Steve Seeger (TN)

OAS Chair

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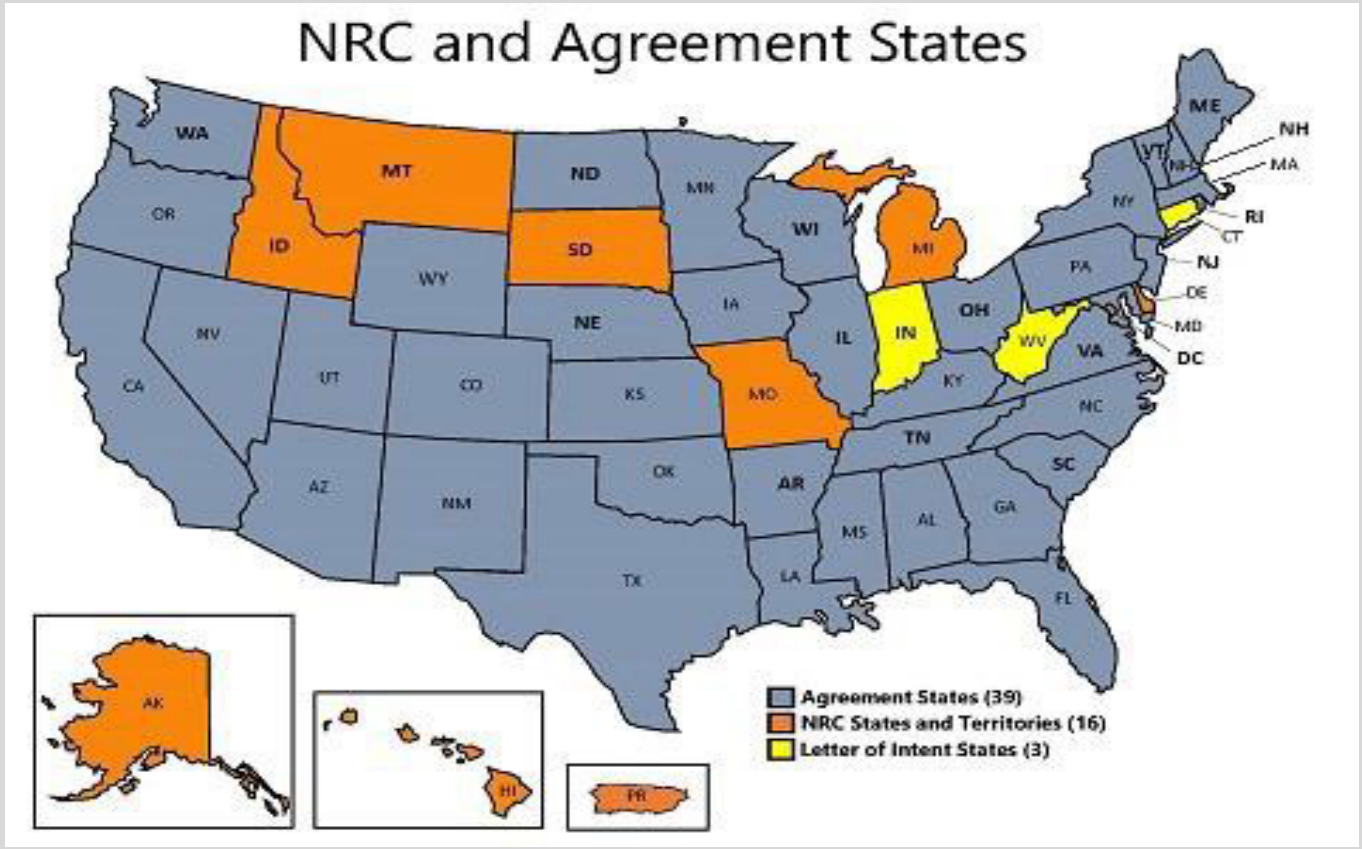
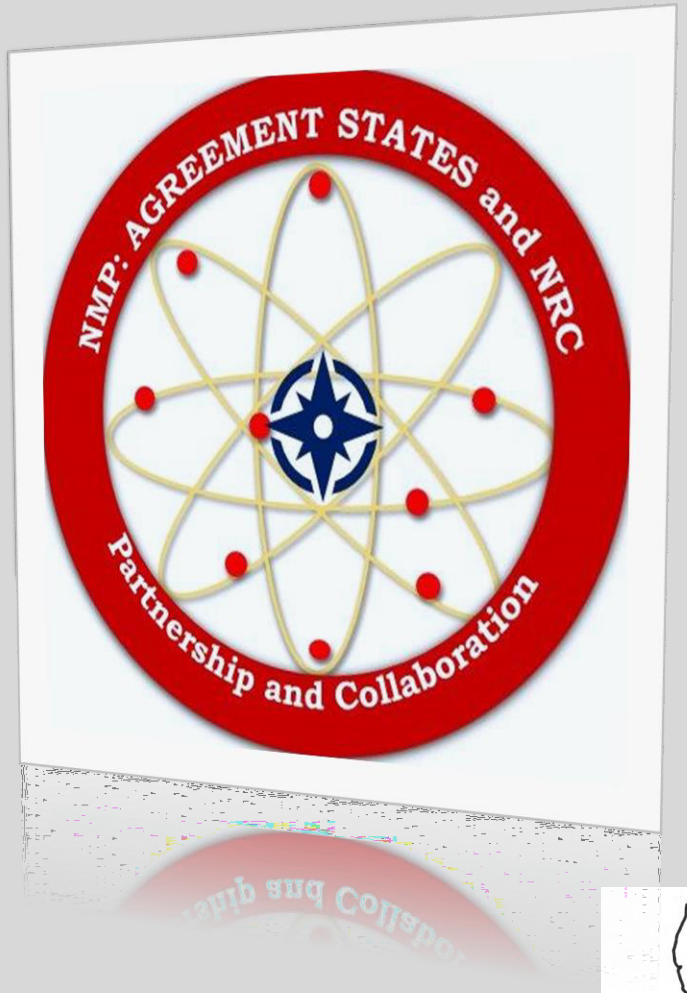
A Growing NMP





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NMP National Materials Program

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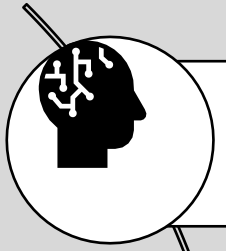
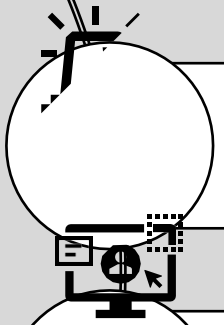
Building a Stronger Future

Organization of Agreement States

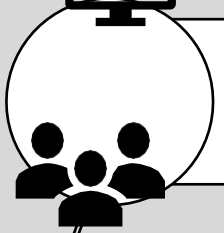
2022-2023 NMP Priorities



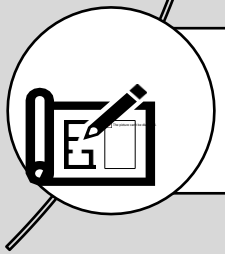
Innovation: IMPEP, Inspection Program, Program Elements



Technology: State Communications Portal, WBL



People: Training, Recruiting and Retention, Centers of Excellence



NMP Mission: NMP Performance Metrics

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Shared Responsibilities and Partnership

Communicating and Sharing Information

Industry Trends

New Technologies

Incidents

Requesting Assistance

Integrated Materials Performance Evaluation Program (IMPEP)

Improved Performance

Regulatory Consistency

Teamwork: State and NRC Personnel

Being Active Contributors

Working Groups

Centers of Excellence

Commenting

Meeting Participation

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Past and Future Activities

CRCPD Meetings

OAS Meetings

Champions' Chats

Government to Government (G2G)

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CRCPD INITIATIVES AND ACCOMPLISHMENTS

PATRICK MULLIGAN, NJ
(CRCPD PAST CHAIR)

2022-2023 Board Priorities

- Be Proactive in Handling New Issues.
- Increase the Availability of Electronic Based Information.
- Promote Opportunities for Participation in Committee Activities.
- Provide Training Opportunities for CRCPD Members.
- Continue and Enhance the Relationship Between the CRCPD and the Organization of Agreement States (OAS).

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CRCPD Initiatives and Accomplishments

CRCPD EXTENDS PRACTICAL ARRANGEMENTS WITH INTERNATIONAL ATOMIC ENERGY AGENCY

- naturally occurring radioactive material (NORM);
- reduction of radiation exposure from radon;
- radiation protection of patients, especially where new radiation source technologies are used.

The scope of the Practical Arrangements for the next three years are still focused on the original areas of radiation safety, but have been modified slightly to include:

- working collaboratively in the area of contaminated or radioactive materials (including NORM and TENORM) containing non-food consumer goods or commodities
- working collaboratively in the area of preparation of guidance and other relevant materials addressing exposures from radionuclides in food in non-emergency situations.

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CRCPD Initiatives and Accomplishments

International Support for Radiation Protection

- Revision of IAEA Safety Standards Report
- IAEA Topical Session on Radiation Safety of Non-food Commodities
- Support for IRPA-16 in 2024

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CRCPD Initiatives and Accomplishments

International Support for Radiation Protection

- South America Regional BSS Workshop
- European Regional BSS Workshop on the Management of Existing Radiation Exposure Situations
- African Regional BSS Workshop on radiation protection and safety in the management of existing exposure situations

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CRCPD Initiatives and Accomplishments

HS/ER-4 Committee for Evaluation of Guidelines, Resources & Tools for Radiological and Nuclear Emergency Response & Recovery

- Developed and implemented a new process to create a State ROSS Task Force. Up until this time, ROSS were assigned to one of six national task forces. Texas became the first State ROSS Task Force
- Developed and implemented a new process where HS/ER-4 serves as the Qualification Review Board (QRB) for ROSS advancing from Type 4 to 3 to 2 to 1.
- By the end of FY 23, there may be between 300 and 400 ROSS. The project team are seeking to secure funding to develop a mechanism to manage and support the program.

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CRCPD Initiatives and Accomplishments

DOT Exemption Form and Transportation

- The E-48 Task Force to Develop Best Practices for use of DOT Special Permits added minor edits for clarity and usability to the two Department of Transportation Special Permit forms, DOT SP 10656 and 11406. They are now in a fillable PDF format.
- DOT Exemption E-48: Updated the special permit forms and are developing an accompanying guidance document. The permits, one for radioactivity in scrap and the other for radioactivity in solid waste, are in the process of renewal at DOT.

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CRCPD Initiatives and Accomplishments

Suggested State Regulations

- SSR Part C - “Licensing of Radioactive Material” major overhaul.
- SSR-Part N - TENORM. Considering making Part N a high-level document supplemented by technical guidance documents
- SSR Part X - “Therapeutic Radiation Machines" was the first SSR to be posted for public comment.
- SSR Part G - Use of Radionuclides in the Healing Arts. This document incorporates all NRC changes to 10 CFR 35 since subpart G was last updated in 2003

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CRCPD Initiatives and Accomplishments

Suggested State Regulations Initiatives

- Forms have been revised and are now in a pdf fillable format.
- Develop a crosswalk between the SSRs and NRC regulations. Some additional work is needed that will require revising some of the SSRs.
- Recruit members for SR-CC NRC RATS Compatibility Tracking Working Group.
- Develop system for the routine review of SSR Parts. Expected to be completed by May 2023 annual meeting.

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Kudos to NRC 2023 SLO Conference

- Demonstrates the NRC values SLO interaction
- Minimizes risk of significant disconnect between states and NRC
- Helps the SLOs meet the information needs of our Governors

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Fusion and Emerging Regulatory Framework

Augustinus Ong, OAS Past Chair (NH)

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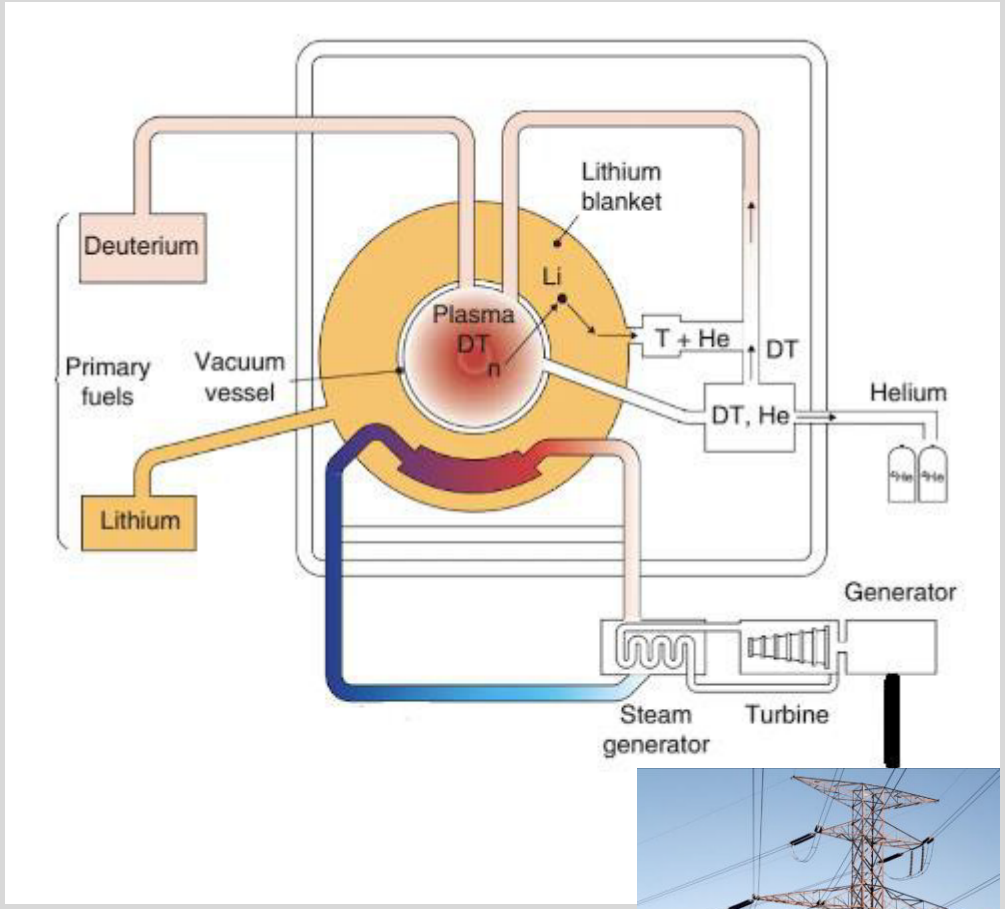
Overview of Fusion Facility

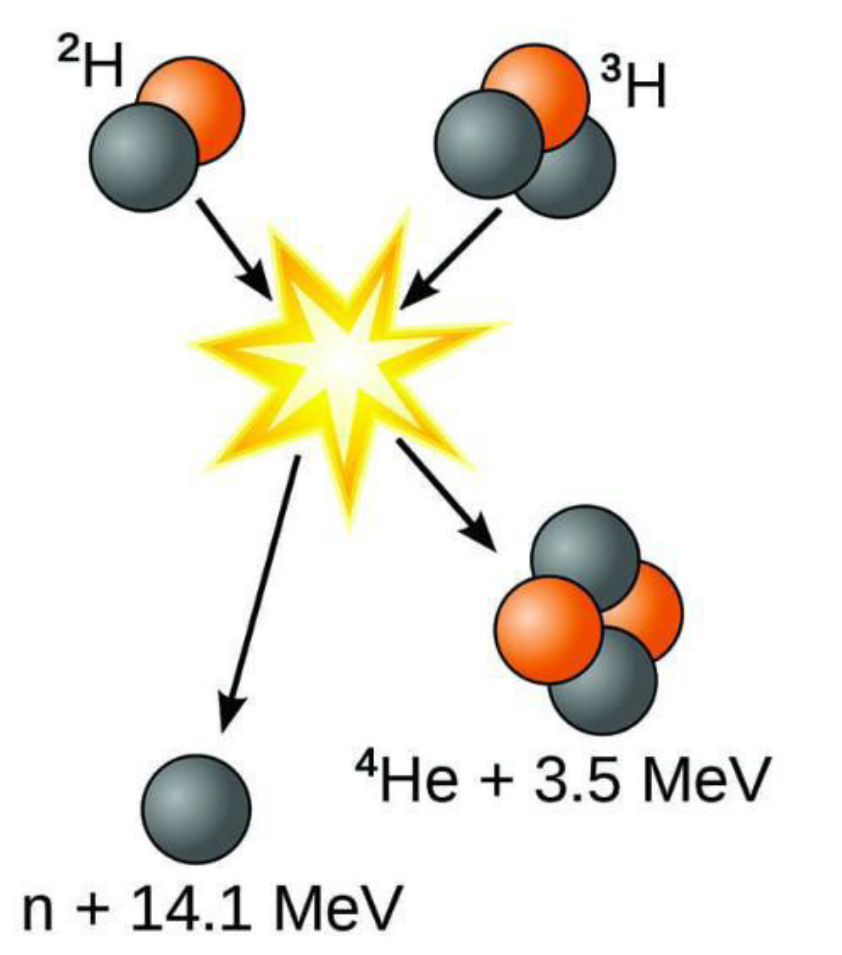


Modified schematic diagram of a fusion power plant taken JET-EFDA publications.

Fusion power is a proposed form of power generation that would generate electricity by using heat from nuclear fusion reactions.

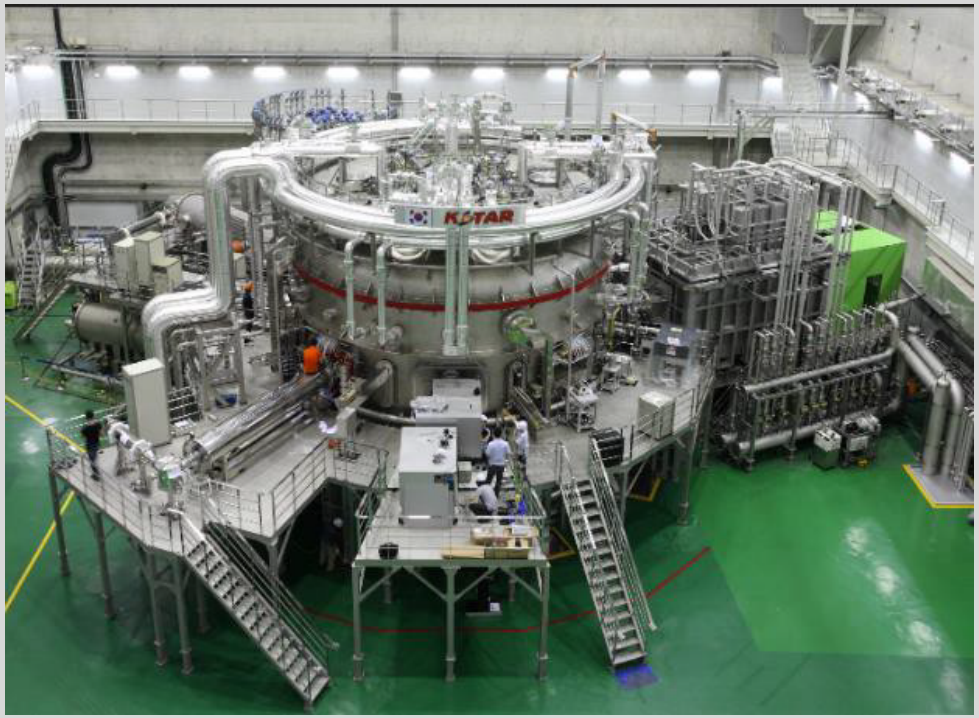
Devices designed to harness this energy are known as fusion reactors.

Schematic Diagram of Fusion Power Plant



In a fusion process, two lighter atomic nuclei combine to form a heavier nucleus, while releasing energy.

Tokamak Fusion Reactors



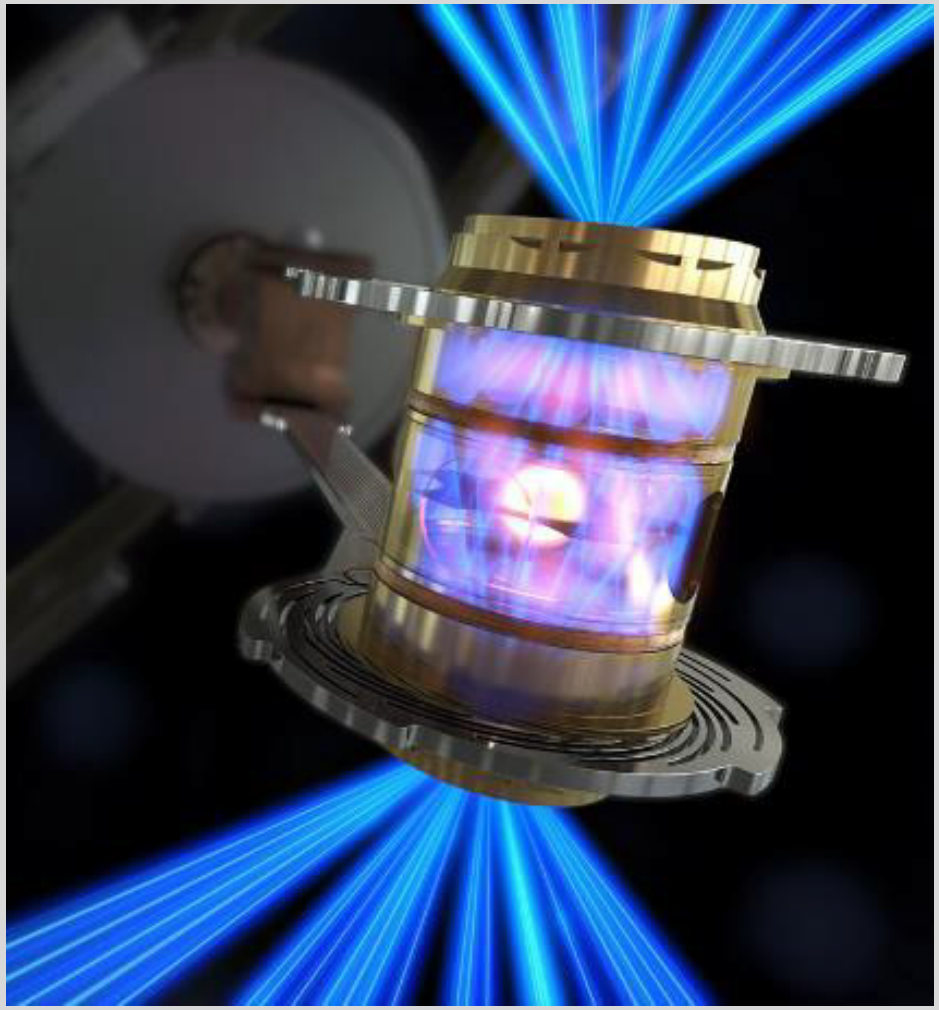
KSTAR (Korean Superconducting Tokamak Advanced Research)

Fusion gain (expressed as the symbol Q) is the ratio of fusion power to the input power required to maintain the reaction.

Q = 1 represents the breakeven point, but because of heat losses, burning plasmas are not reached until about Q = 5.

Current tokamaks have achieved around Q = 0.6 with DT reactions. Fusion power plants will need to achieve Q values well above 10 to be economical.

Energy Gain = 1

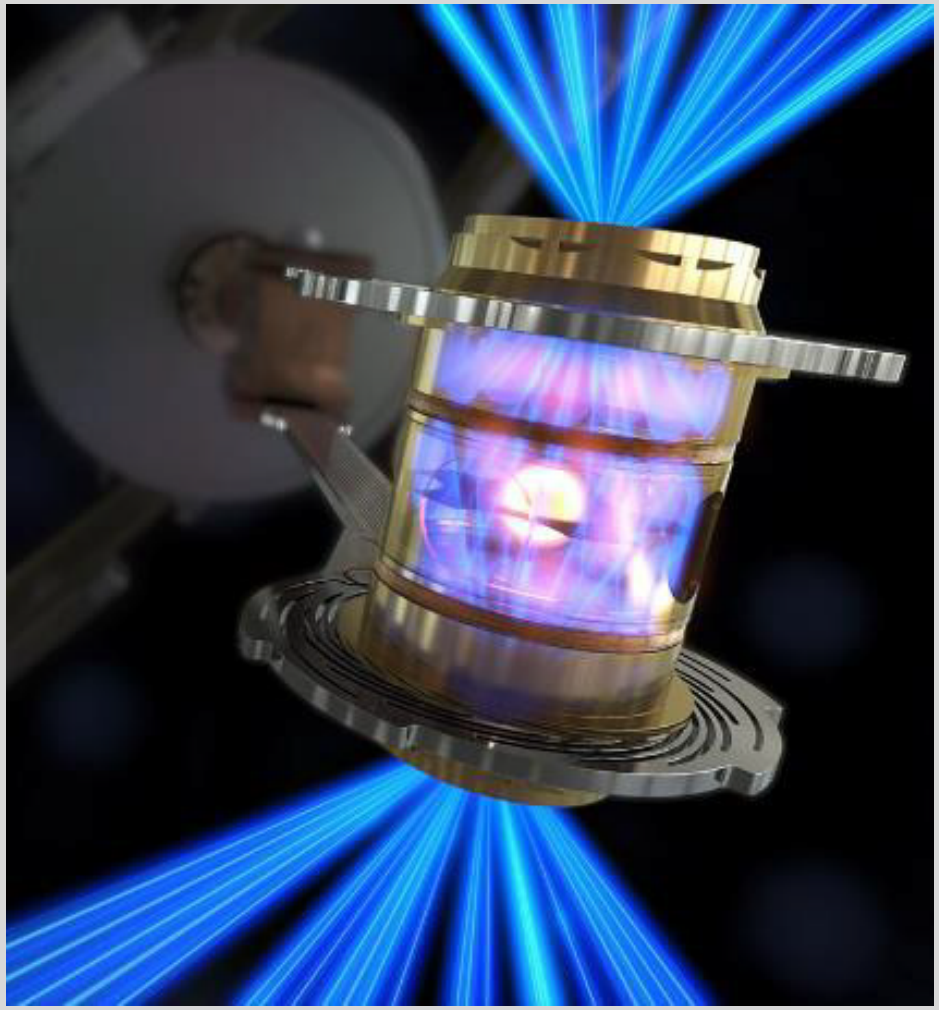


More energy out than in, known as energy gain.

On December 5, 2022 researchers at the National Ignition Facility (NIF) in California finally achieved this energy gain, focusing 2.05 megajoules of laser light onto a tiny capsule of fusion fuel and sparking an explosion that produced 3.15 MJ of energy—the equivalent of about three sticks of dynamite

Source: www.science.org/content/article/historic-explosion-long-sought-fusion-breakthrough

Total Energy Input?



- If gain meant producing more output energy than input electricity, however, NIF fell far short.
- Its lasers are inefficient, requiring hundreds of megajoules of electricity to produce the 2 MJ of laser light and 3 MJ of fusion energy.
- Moreover, a power plant based on NIF would need to raise the repetition rate from one shot per day to about 10 per second.
- One million capsules a day would need to be made, filled, positioned, blasted, and cleared away—a huge engineering challenge.

Source: www.science.org/content/article/historic-explosion-long-sought-fusion-breakthrough

Agreement States Initiatives:
Developing a case-by-case regulatory framework for advanced fusion devices

Current Fusion Devices Licensed by Agreement States

- **Avalanche Energy** (Tukwila, WA): Fusion power pack called the "Orbitron" in a form-factor the size of a lunch pail. (5kWe)
- **CTFusion, Inc.** (Seattle, WA): Spheromak with lithium neutron "blanket." (75-125 Mwe)
- **Commonwealth Fusion Systems** (Devens, MA): Tokamak with lithium neutron "blanket" for thermo-energy capture. (200 MWe)
- **Compact Fusion Systems, Inc.** (Santa Fe, NM): Field reversed configuration and using liquid metal with heat exchanger. (100 MWe)
- **Electric Fusion Systems, Inc.** (Broomfield, CO): Pulsed high density aneutronic fusion. (10 kWe – 10 MWe, depending on number of cartridges and modules)

NRC Initiatives: Developing a technology-inclusive regulatory framework for advanced fusion devices

- SECY-23- 0001: The Commission has approved the staff's recommendation to license and regulate fusion energy systems under the Nuclear Regulatory Commission's byproduct material framework contained in 10 C.F.R. Part 30, "Rules of General Applicability to Domestic Licensing of Byproduct Material," and associated regulations.

Agreement States' Experience with Licensing Fusion Devices

A. Licensing has been a significant challenge. In general, Agreement States are issuing licenses under strict conditions.

   For example, limits on tritium possession, and issuing licenses in phases and scaling it as the licensee gains experience.

B. Training issues: hands-on training commensurate with certain high-risk licensed activities.

C. Shielding plan reviews have also been hard for states' materials group because they have not previously worked with neutron radiation and needing to determine possible neutron dose to public.

Agreement State Programs' Recommendations

A. Main message to fusion companies is: engage with their respective state regulators early, even if they are several years away from needing a RAM license.

B. Licensing group would need as much information as they can get on where a company is headed—that will help the group to prepare for licensing and training staff in advance of receiving a license application.

   One caveat: With the diversity of proposed technologies, a licensing approach that works for one company may not be applicable to another.

C. Agreement States need to engage NRC's technical staff, DOE/national labs, early on the pre-licensing phase and often.

Questions?

Augustinus Ong

Augustinus.ong@dhhs.nh.gov

OAS Working Group Co-Chair

CRCPD Efforts in Health Physics Workforce - Recruitment and Retention

Jeff Semancik (CT) – CRCPD Past Chair

CRCPD's four major objectives:

- Promote consistent radiation protection practices
- Provide leadership in radiation issues
- Improve efficiency in providing radiation protection
- Enhance relationship with members

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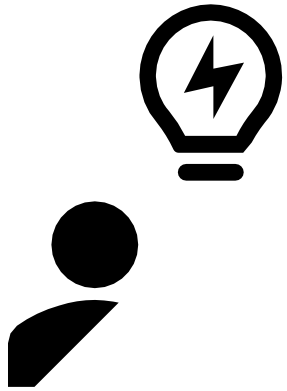
A Partnership Dedicated to Radiation Protection

Conference of Radiation Control Program Directors, Inc. (CRCPD) is a 501(c) (3) nonprofit, non-governmental, professional organization whose primary membership is comprised of radiation professionals in State and local government that regulate the use of radiation sources

G-74 Health Physics Work Force Development and Coordination



- Sarah Sanderlin– chair
- Joe Nick – NRC representative
- Janise Stoliarova – FEMA representative

- **WE NEED MEMBERS!**

CRCPD HP Workforce Development and Coordination Committee Charges

1. Develop a process for sharing experienced staff in a resource deficient environment by designing a framework for a resource-matching program that would allow qualified staff in one regulator's jurisdiction to fill a temporary need in another jurisdiction.
2. Facilitate growth opportunities for Health Physics skills by identifying educational opportunities for Radiological Program Staff.
3. Identify issues that may arise from credentialing and reciprocity. Identify mechanisms that may be used to advertise for opportunities to share resources. Identify potential mechanism to fund resource sharing and potential paperwork to facilitate implementation.
4. Maintain awareness of resources in state, local and federal programs that are available to leverage for support.

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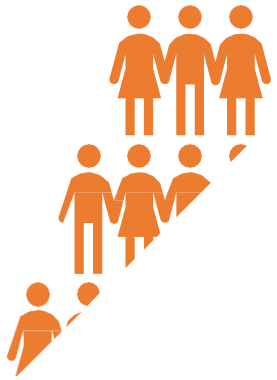
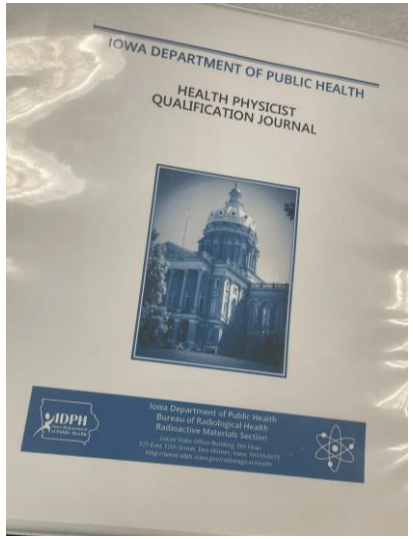
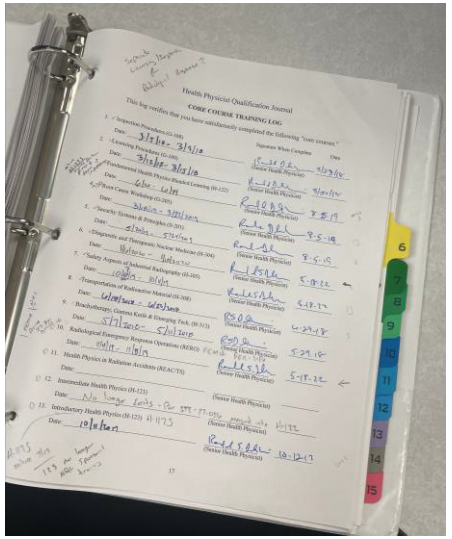
Sharing happens already....
Committee work to streamline and facilitate sharing of resources

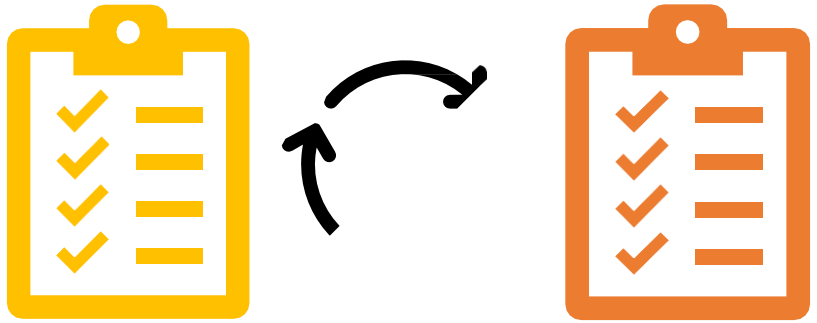


Identify resources -personnel -expertise	Make the request	Establish agreements to streamline sharing	Establish common documentation to minimize duplication

Can we establish Reciprocity for Inspector and License Reviewer Qualifications?

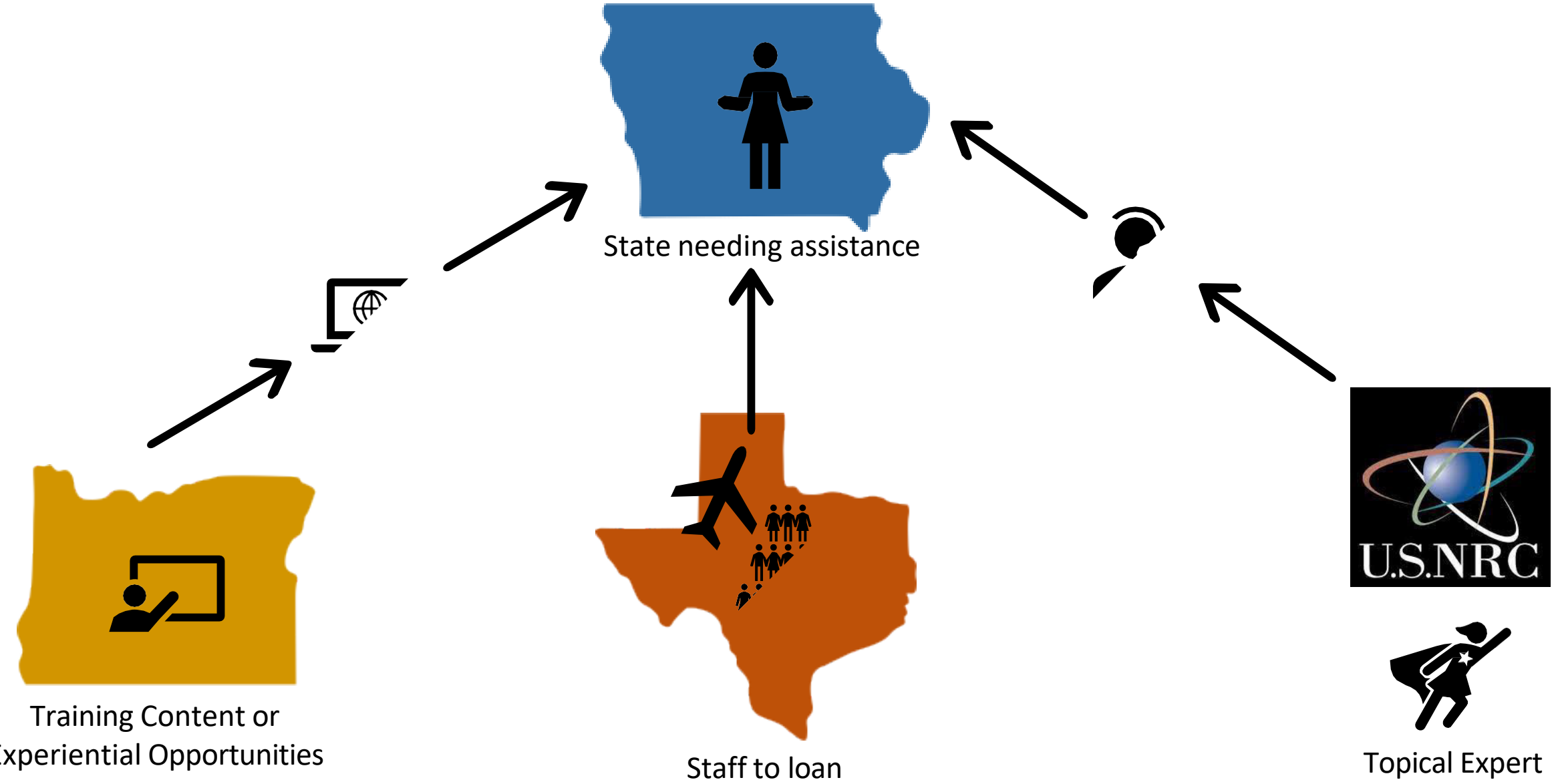






Key – Must be recognized by IMPEP Team

Example concept for facilitating sharing of resources….



Set up a system to make it easier to find available support and expertise – build on others…..

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United States Nuclear Regulatory Commission
Protecting People and the Environment

NMSS HOME | IMPEP | NAT'L MATERIALS PROGRAM | POLICY & PROCEDURES | NMSS OFFICE DIRECTORY | STATE REGULATIONS

Resources & Tools

- What's New
- What's Due?
- National Materials Program
- Agreement State Program Basis Documents
- Medical Toolkit
- SS&D Sheets
- NMSS Procedures
- Regulation Toolbox
- IMPEP Toolbox
- Materials Security Toolbox
- NARM Toolbox
- IR Certification
- Training & Travel
- State and Tribal Communications (STC) (formerly FSME) Letters
- Radiation Control Program Directors (RCPD) Letters

National Materials Program - Centers of Excellence

Two centers of excellence have been identified:

- Medical Emerging Technologies
- Sealed Source and Device (SS&D)

Charters are under development to make the centers sustainable and will include resource sharing bet
Agreement States and NRC to support NMP activities.

Back to NMP Introduction

Page last modified on Friday June 19 2020.

HPS Specialists in Radiation Protection

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Members Directory

Your membership expires on December 31, 2022.

Use the button below to change your Directory listing. The HPS Secretariat will be notified automatically of any changes you make to your Directory information.

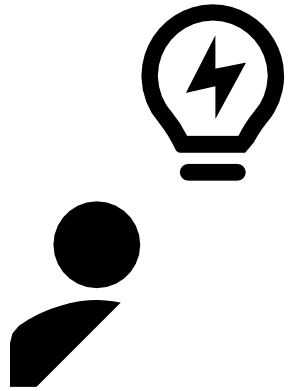
Update Directory

Find a Member

Use the search options below to find information (e.g., address, phone, email) for other HPS members.

Find members matching: Free-form search
Filter: Anything
Find members by state: -- select --
Find members by country: -- select --
Find section members: -- select --
Find members by speciality: -- select --
Find officer: -- select --
Subject Matter Expert: -- select --
CHPs only
Find

G-74 Health Physics Work Force Development and Coordination



Focus on entire radiation control program scope as well as NMP

Looking forward to identifying potential solutions and creating new procedures for the entire NMP to leverage

- **WE NEED MEMBERS!**

RULEMAKING AND POLICY

KEISHA CORNELIUS, OK (OAS CHAIR ELECT)

OAS Involvement in Rulemaking

- OAS Director of Rulemaking is the co-chair of the Standing Committee on Compatibility
- Member of Common Prioritization of Rulemaking Working Group
- Comment letters sent to NRC in 2022 and 2023
  - 2022:
    - 11 items sent to states for request for comments
    - 6 items received comments and we sent a comment letter to NRC
  - 2023 (through May 2023):
    - 3 items sent to states for request for comments
    - 2 items received comments and we sent a comment letter to NRC
  - 1 item pending: STC-22-070, interim procedure SA-400, comments will be due to NRC 6/2/23

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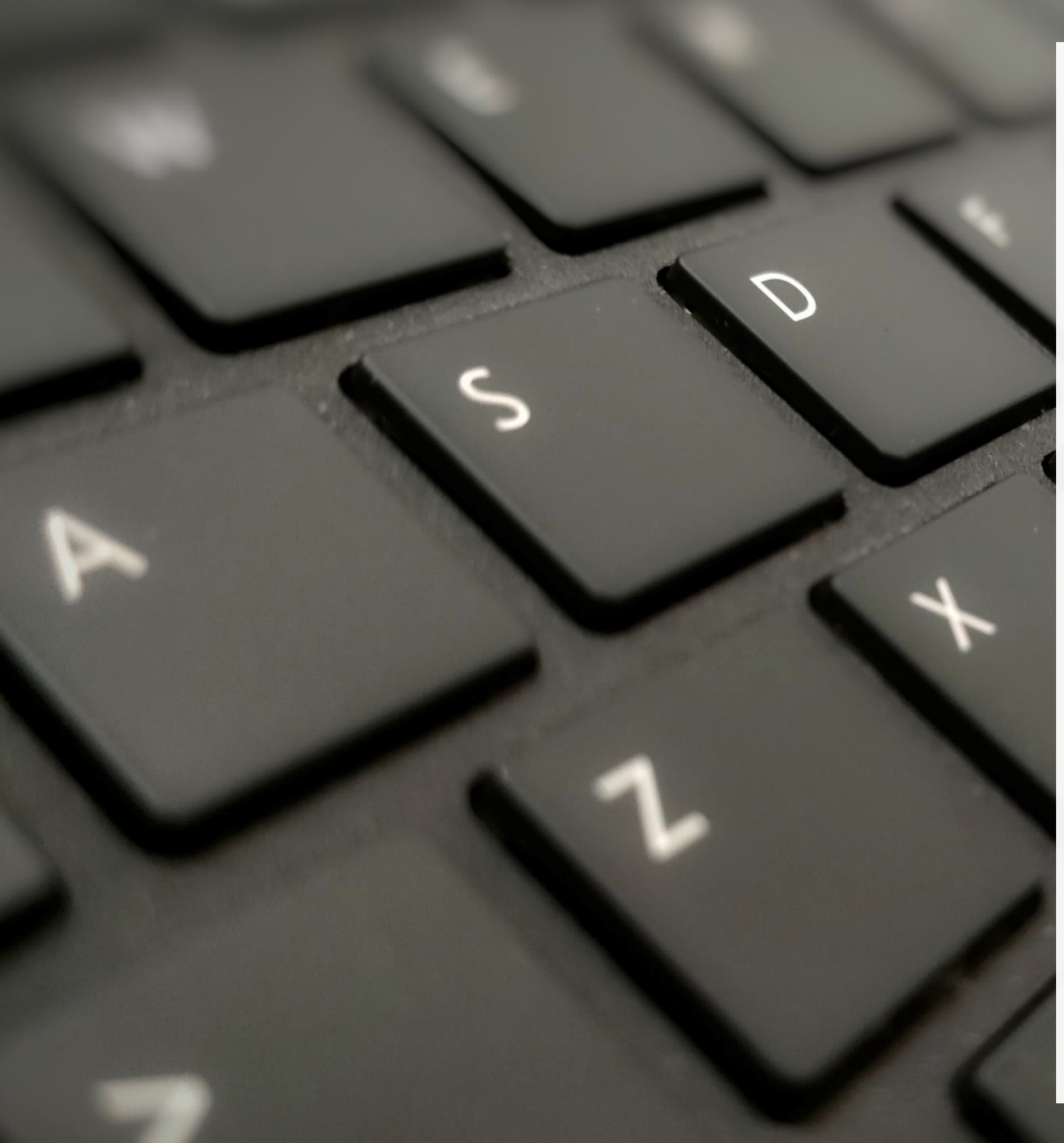

OAS Comments

- STC-22-033, Interim Procedure SA-300, Reporting Material Events, and the Interim Handbook on Nuclear Material Event Reporting for the Agreement States.

- STC-22-065, Revised Interim Handbook on Nuclear Material Event Reporting for the Agreement States

- Nuclear Regulatory Commission (NRC) preliminary regulatory basis for the 10 CFR Part 35 rulemaking to establish requirements for rubidium-82 generators and emerging medical technologies

- STC 22-057 Nuclear Regulatory Commission (NRC) proposed rule of Harmonization of Transportation Safety Requirements with International Atomic Energy Agency Standards

- Nuclear Regulatory Commission (NRC) draft Federal Register notice for “Radioactive Source Security and Accountability Rulemaking"

Rulemaking and Compatibility

- Agreement State Issues with Compatibility
  - Legislation, Regulations, and Other Program Elements during IMPEP
  - Long rulemaking timeline

- Risk Informing Compatibility
  - 3 year adoption not necessary for miscellaneous corrections to CFR
  - Including an approved license condition with major rulemaking

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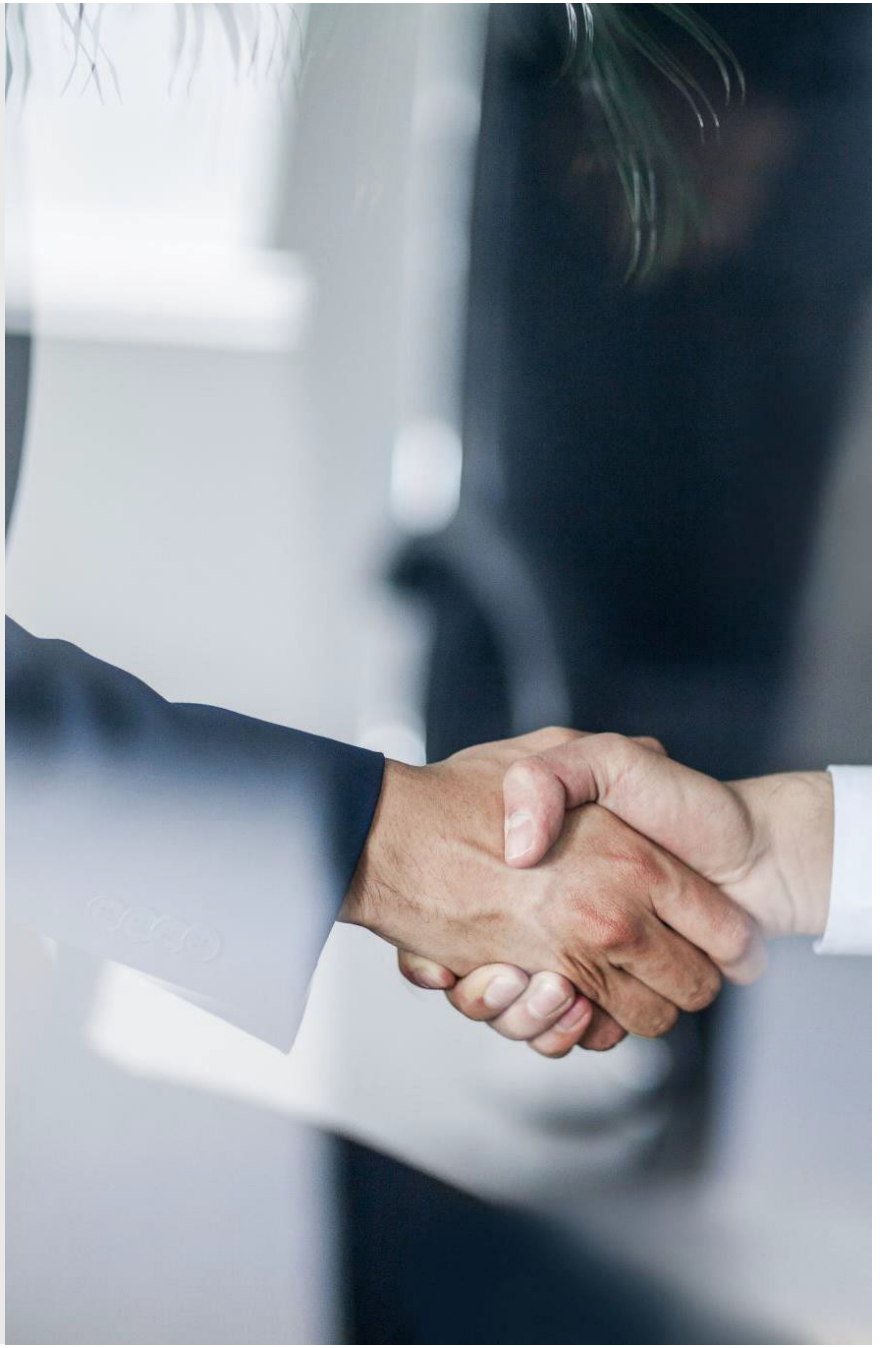

CATEGORY 3 QUANTITY SOURCE SECURITY RULEMAKING

- In the GAO July 2022 document, "Preventing a Dirty Bomb: Vulnerabilities Persist in NRC's Controls for Purchase of High-Risk Radioactive Materials," there were two recommendations for Executive Action by the Chairman of the NRC
- NRC should immediately require that vendors verify category 3 licenses with the appropriate regulatory authority
- NRC should add security features to its licensing process to improve its integrity and make it less vulnerable to altering or forging license

CATEGORY 3 QUANTITY SOURCE SECURITY RULEMAKING

- October 2022, Opportunity to comment on the NRC's draft Federal Register notice for "radioactive source security and accountability rulemaking" with a 30 day comment period.
- OAS sent Comment letter on November 10, 2022
- OAS anticipates an abbreviated adoption period
- OAS drafted a license condition based on the draft Radioactive Source Security and Accountability Rulemaking. It was sent to NRC for approval and rejected.

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Future Collaborative Efforts
Rikki Waller, ID (CRCPD Chair)

- Check Cap
- Veterinary Release of Treated animals
- DOT Lost/Misplaced Material Tracking

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Check Cap

This device is marketed as: “The first and only patient-friendly preparation-free test to detect precancerous polyps and enable early intervention and cancer prevention.”

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Check Cap Concerns

- Safety before patient administration
- Safety during the procedure – is the radiation form the Cap Check source measurable externally?
- The Check Cap will be expelled directly into the sewer system. Even if there were instructions for the patient to capture the device, will the patient be compliant?

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The Use of Isotopes on Household Pets

- One product in use is from Exubrion Therapeutics called Synovetin OA®. It utilizes Tin-117m to treat arthritis and other medical conditions in a variety of species. This product is injected into the patient elbow joint as an outpatient procedure.
- While intensity-modulated radiation therapy (IMRT) and more recently, stereotactic radiation therapy (SRT) are the current preferred methods of treatment, new treatments utilizing isotopes are being studied.
- A treatment for feline nasal squamous cell carcinoma in cats is currently in use. Strontium plesiotherapy is where high doses of radiation are delivered with a small probe to a very small and specific area. It can also be used for other types of tumors

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The Use of Isotopes on Household Pets

- Brachytherapy and biologically targeted radiotherapy in animals is starting to gain more interest. Radioiodine to treat thyroid cancers in veterinary patients has been used for years. However, bone-seeking radioisotopes treatment of metastatic bone growths have proven to be useful in the treatment of primary and metastatic bone cancer in dogs and cats. As more agents of this type are being introduced, this type of therapy will find more use in the veterinary world.
- **Concerns:** The main concern is the treatment of the pet and its body fluids following this type of procedure. The pet owner will not likely comply with instructions to keep the rated pet away from people and other pets. Disposal of items containing bodily fluids is also a concern.

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DOT Lost/Misplaced Material Tracking

- Material shipments using independent carriers fall under DOT regulations
- Lost/Misplaced shipments are reported to Agreement State programs either by producer or end product user (licensees)
- Agreement state programs typically have a very difficult time getting information from independent carriers
- Very little follow up on status, some material shipment can be misplaced for weeks
- DOT is very slow to intervene

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Artificial intelligence (AI) in Radiation Protection

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Potential Benefits of AI in Radiation Protection

- AI has the potential to significantly impact radiation protection by improving the accuracy and efficiency of radiation monitoring, reducing the potential for human error, and aiding in decision-making processes
  - Monitoring radiation levels in real-time, detect abnormalities, and predict potential hazards
  - Determining the most appropriate dosimetry method and can also help in the interpretation of dosimetry data
  - Assisting in radiation therapy treatment planning
  - Analyzing data from radiation detectors and providing alerts

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Concerns for use of AI in Radiation Protection

- Ensure the use of AI is carefully evaluated, properly implemented, and continuously monitored to ensure accuracy, reliability, and safety.
  - Errors in AI systems can lead to incorrect readings or recommendations
  - Use of AI in radiation protection could lead to over-reliance on technology, potentially leading to complacency or a lack of appropriate training and expertise
  - AI systems used in radiation protection may be vulnerable to cyber-attacks or data breaches
  - Ethical concerns regarding the use of AI in radiation protection, such as the potential for bias in decision-making processes or the misuse of data
  - Legal liability concerns, such as who is responsible in case of errors or failures
- Establish clear guidelines to address the ethical, regulatory, legal, and social implications of AI in radiation protection

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CRCPD Task Force on AI

- AI is a reality
  - Capabilities are rapidly advancing
- Forming a task force to evaluate impacts of AI on radiation protection
  - Charges have been drafted
  - Establishing members
  - Federal resource individuals
  - Coordination with CISA (Cyber and Infrastructure Security Agency)
  - Goal – provide white paper and recommendations

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

Coordination continues US NRC - CRCPD - OAS

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

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Questions?