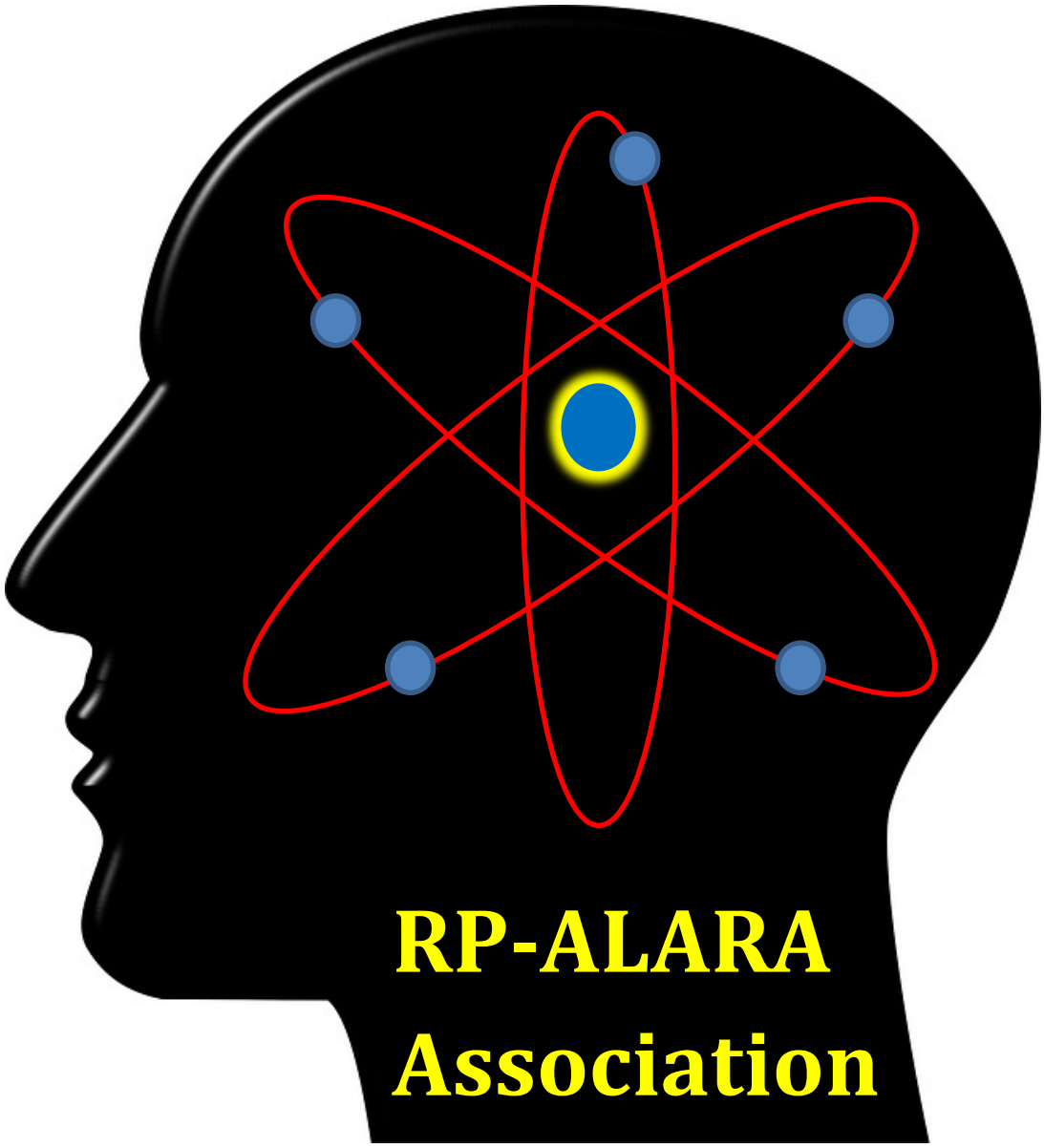
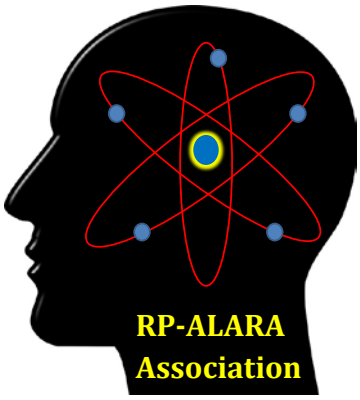


2022 Summer Meeting
Chattanooga, TN
June 20-22, 2022



2022 Board of Directors

Chairman

2022-2024 Term

Joe Coughlin (815-417-2722) joseph.coughlin@exeloncorp.com – Braidwood

Vice-Chairman

2022-2023 Term

2024-2026 Term as Chairman

Kinsey Boehl (603-773-7638) kinsey.boehl@fpl.com – Seabrook

Secretary

2019-2022 Term

Bob French (620-203-1670) bob.french@evergy.com – Wolf Creek

Treasurer

2022-2024 Term

Frank Owens (217-937-2703) frank.owens@constellation.com – Clinton

Steering Committee "At Large" Members

2020-2022 Term

David Martin (651-267-6031) david.r.martin@xcelenergy.com – Prairie Island

2020-2023 Term

Michelle Williams (706-848-4236) miwillia@southernoco.com – Vogtle 1&2

2020-2024 Term

Avril Stewart (954-756-1163) agstewart@tva.gov – Watts Bar

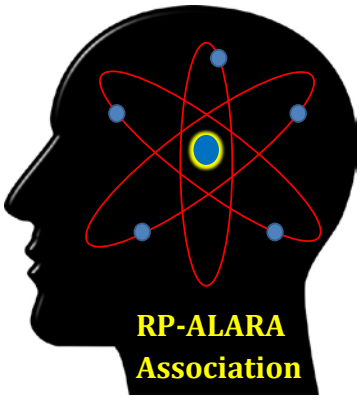
Angela Williams (480-364-4883) angela.williams@aps.com – Palo Verde

Past-Chairman / Advisor

2022-2024 Term

Jeff Fontaine (retired)

**** Terms begin/end after the Summer Meeting of the year indicated ****



Chattanooga, TN
June 20-22, 2022

MEETING BOOK INDEX

RP-ALARA Association Meeting Agenda
Chattanooga, Tennessee - June 2022

Sunday, June 19

4:00 – 6:00 pm Steering Board Members - Pre-Meeting & Appetizers

Note To all the RP-ALARA Association Representatives:

This is to inform you that the RP-ALARA Association Meeting has been granted 1 CEC per contact hour to a maximum of 20 CEC and assigned ID 2019-00-001. This credit applies to calendar years 2020-2022.

Please be advised that contact hours do not include meals or business meetings without technical content.

As credit was requested for all participants, this assignment will be posted to the AAHP website.

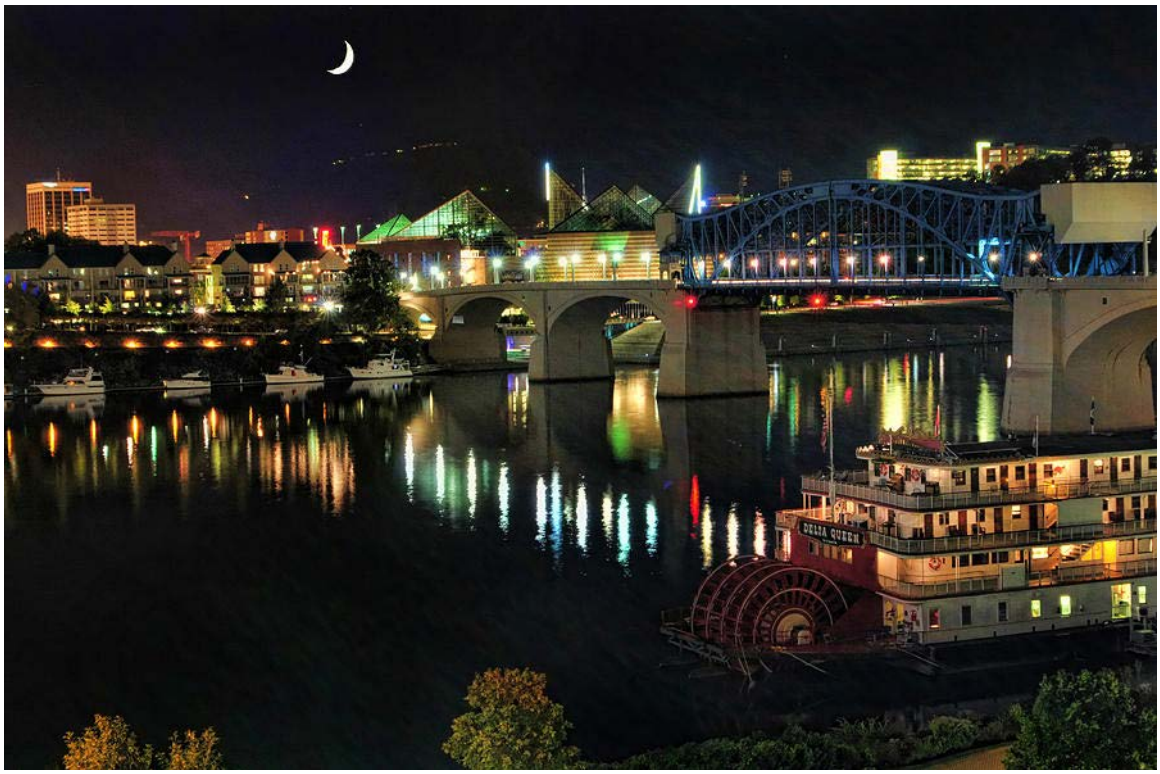
Monday, June 20

2:00 – 2:30 pm	Meeting Registration – Plaza C Foyer
2:30 – 3:15 pm	Opening Ceremonies & Introduction – Plaza C • Welcome – Opening Remarks (Joe Coughlin) • Safety Review – Building Escape Routes (TBD) • Safety Message (TBD) • Introduction of NSA Representative (Rick McCormick) • Introductions of Board Members (Joe Coughlin) • Introduction of Association Members (All) • Association Secretary Report (Bob French) • Association Treasury Report (Frank Owens) • Establish Meeting Expectations/Review Agenda & Meeting Book Contents (Joe Coughlin) • Benchmark Question Solicitation & High Interest Topic Sheets (TBD) • Elections this meeting (Joe Coughlin)
3:15 – 4:15 pm	Presentation: EPRI Update – Daniel Wells

4:15 – 4:20 pm Adjourn Day 1 (Joe Coughlin)

4:30 – 4:50 pm Steering Committee Meeting

5:00 – 6:30 pm Opening Reception & Vendor Displays – Plaza AB



Tuesday, June 21

07:00 – 08:00 Breakfast with Vendors – Plaza AB

08:00 – 08:05 Meeting Overview (Joe Coughlin)

08:05 – 08:10 Safety Message (Michelle Williams)

08:10 – 08:20 Association Group Picture

08:20 – 09:40 Breakout Sessions by Plant Type (Document Successes & Challenges and a Golden Nugget)

- 4 Loop Westinghouse Group 1 (Joe Coughlin)
- 4 Loop Westinghouse Group 2 (Bob French)
- 2 Loop & 3 Loop Westinghouse (TBD)
- B & W, CE and BWR's (Frank Owens)

09:40 – 10:00	Break / Vendor Interface (Report to Break out Rooms after break)
10:00 – 11:30	Breakout Session by Plant Type (Document Successes & Challenges and a Golden Nugget) • 4 Loop Westinghouse Group 1 (Joe Coughlin) • 4 Loop Westinghouse Group 2 (Bob French) • 2 Loop & 3 Loop Westinghouse (TBD) • B & W, CE and BWR's (Frank Owens)
11:30 - 11:40	10 Minute Break (Report to conference room after break)
11:40 – 12:30	Vendor Presentations
12:30 – 1:30	Lunch
1:30 – 2:30	Vendor Presentations
2:30 – 2:45	15 Minute Break
2:45 – 3:15	Vendor Presentations (Remaining vendors)
3:15 – 3:45	Presentation: Ultrasonic Decontamination – Joe Jaegers
3:45 – 3:50	End of Day Comments / Adjourn Day 2 (Joe Coughlin)
4:00 – 4:30	Steering Committee Meeting
5:00 – 6:30	Vendor Reception – Plaza AB

Wednesday, June 22

07:30 – 08:30	Breakfast with Vendors – Plaza AB
08:30 – 08:35	Safety Message (TBD)
08:35 – 09:40	Breakout Session Review (Successes, Challenges and Golden Nuggets)
09:40 – 09:50	10 Minute Break
09:50 – 10:35	Continue Breakout Session Review (Successes, Challenges and Golden Nuggets)
10:35 – 11:00	Break / Vendor Interface
11:00 – 12:00	Continue Breakout Session Review (Successes, Challenges and Golden Nuggets)
12:00 – 1:10	Lunch / Passport Drawing
1:10 – 2:10	Complete Breakout Session Review (Successes, Challenges and Golden Nuggets)

2:10 – 2:20 10 Minute Break

2:20 – 3:00 Round Table Topic Discussions

3:00 – 3:15 Closing Remarks and Update on 2023 Winter Meeting (Key West Florida)

January 23-25, 2023

3:30 – 4:30 Steering Committee Post-Meeting

- Opening Remarks
- Welcome New Members
- Review Meeting Critique Sheets
- New Business

RP-ALARA Association

Chattanooga, TN
June 20-22, 2022
MEETING NOTES

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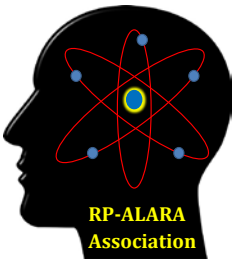

Optional

Name:_____

Utility: _____

Summer 2022 * Chattanooga, TN *** June 20-22, 2022**

MEETING CRITIQUE

The goal is to meet your expectations regarding this meeting. Please help us by providing your comments and suggestions regarding the following:

Plant Status Reports (summer meetings only): _____

_____

Technical Content: _____

_____

_____

Vendor Participation: _____

_____

Meeting Format (Breakout Session vs. Presentation, etc.): _____

_____

_____

Facilities (Meeting Room, Hotel Facilities, Location, etc.): _____

_____

_____

Please list any topics you would like to see the Board address in the future. Also include specific recommendations relative to the suggested presentation format, where possible (e.g. breakout session, technology presentation, survey, etc.): _____

_____

_____

_____

Please provide suggestions for Board activities or actions which would help justify your company's continued participation in the RP-ALARA Association: _____

_____

_____

_____

Other Comments: _____

_____

_____

Do you anticipate your plant being represented by you or another representative at the Winter 2023 Meeting in Key West, FL? _____ If not, why?

_____

_____

Return completed form to the Committee Secretary prior to the end of the meeting.

RP-ALARA Association Meeting
June 20-22, 2022
Chattanooga, TN
Attendee List by Plant

Braidwood
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STP
STPNOC
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Watts Bar

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Chattanooga, TN
Professional Organization

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704-595-2107 (ofc)
650-391-3038 (cell)
dwells@epri.com

Framatome
David Howard
155 Mill Ridge Road
Lynchburg, VA 24502
434-473-3412
david.howard@framatome.com

RP-ALARA Committee Meeting
June 20-22, 2022
Chattanooga, TN
Vendor List by Company

Advetage Solutions
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Lou Foreaker
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Troy Gill
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Darryl Deist
James Hedtke
Lisa Littrell
Douglas Brainard
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John Ellison
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Benji McWaters
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334-798-1687
bmcwaters@orex.com

Eckert & Ziegler Analytics
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Larry Jassin
1380 Seabroad Industrial Blvd, NW
Atlanta, GA 30318
404-352-8677
larry.jassin@ezag.com

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Robbie Millen
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Erika Suzuki
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esuzuki@gammareality.com

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Shane Robinson
Stan Robinson
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Greg Watson
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Kip Kelley
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tpattison@mirion.com

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PureFlo

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Cai Benavides
James Wierowski
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Radiation Safety

Engagement and Support

Dan Wells, PhD – Sr. Program Manager
Chemistry, Decommissioning and Radiation Safety

RP ALARA Association
Chattanooga, TN, USA
20 June 2022

EPRI 50th ANNIVERSARY

Vision

To be a world leader in advancing science and technology solutions for a clean energy future

Mission

Advancing safe, reliable, affordable, and clean energy for society through global collaboration, science and technology innovation, and applied research.

Together...Shaping the Future of Energy®

COLLABORATION

EPRI's collaborative platform is unrivaled. Our R&D:

- Leverages your research dollars
- Connects you to a global network of peers
- Accelerates deployment of technology
- Mitigates the risk and uncertainty of going it alone
- Positions you as a leader in addressing industrywide challenges

CREDIBILITY

EPRI's independent research is guided by our mission to benefit the public. We offer:

- Objective solutions
- A proven track record
- Scientifically based research you can trust

EXPERTISE

For nearly 50 years, EPRI has been applying R&D to help solve real challenges. With EPRI, you can:

- Reduce expenses and increase productivity
- Be more resilient today and better prepared for tomorrow
- Access an industry repository of collective experiences, technical expertise, and training resources
- Extend your staff and make your teams more robust and more confident
- Benchmark, learn and share best practices
- Increase your awareness of challenges that others are facing and alternate solutions to challenges you might be facing
- Save time and money troubleshooting problems EPRI and its stakeholders have seen before

Who We Are

EPRI is a non-profit organization that performs research to advance safe, reliable, affordable, and clean energy for the public benefit.

Our Members

EPRI members represent 90% of the electricity generated and delivered in the United States, with international participation extending to 45 countries.

Cumulative Expertise from our Global Nuclear Network

GLOBAL PARTICIPANTS

>360 reactors worldwide

GLOBAL BREADTH & DEPTH

>83% of the world's commercial nuclear units

Participants Encompass Most Nuclear Reactor Designs

Radiation Safety Program

- Safe and reliable operation
- Optimize plant operation
- Enhance public and worker safety
- Reduce risks associated with waste management

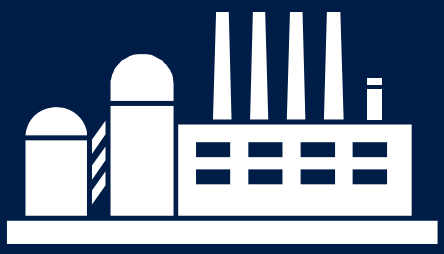
Collaboration
- Global network of peers
- Technical exchange and benchmarking
- Leveraged R&D

Cumulative Expertise
- Knowledge of control history
- New technology development for tomorrow
- More than 20 years of data

Credibility
- Technically based and objective guidance
- Widely applied Guidelines
- Identify and apply the best option

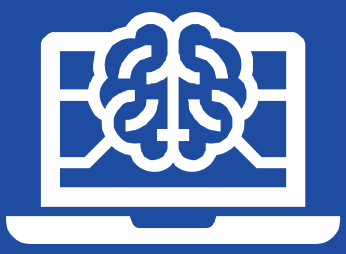
What Do We Do?

Tactical Research



- Address current nuclear power plant needs and challenges

Strategic Research



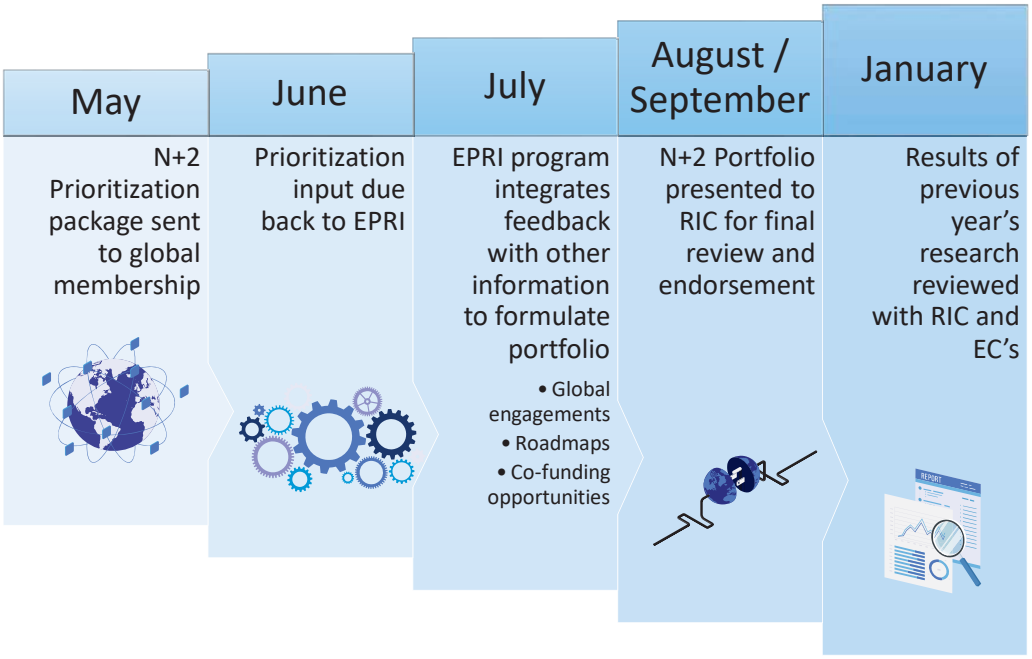
- Address future, long term issues and opportunities

Technical Support

- Implementing EPRI research
- Assessments of plant programs
- Benchmarking

Longer-term, standardized research planning approach

- The EPRI Nuclear Power Sector uses a standardized research planning and prioritization process
- All research portfolio planning is completed on an N+2 planning cycle
- All work grouped and prioritized by Research Focus Areas (RFA)
- RFAs can change over time as work is completed and prioritizes change

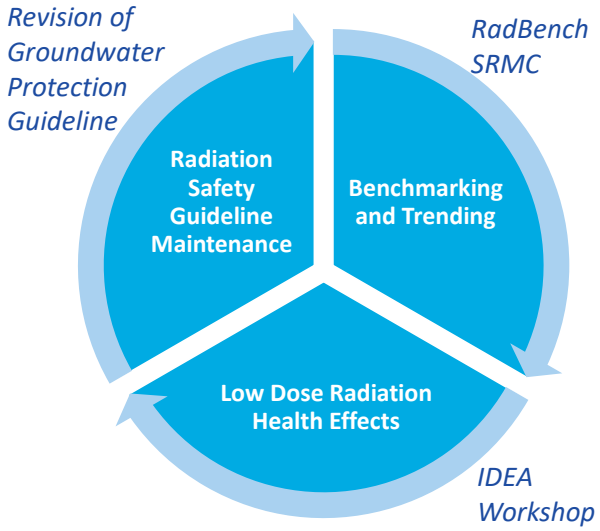


RIC (Research Integration Committee); EC = Executive Committee

Radiation Safety Research Focus Areas (2022)

General Prioritization

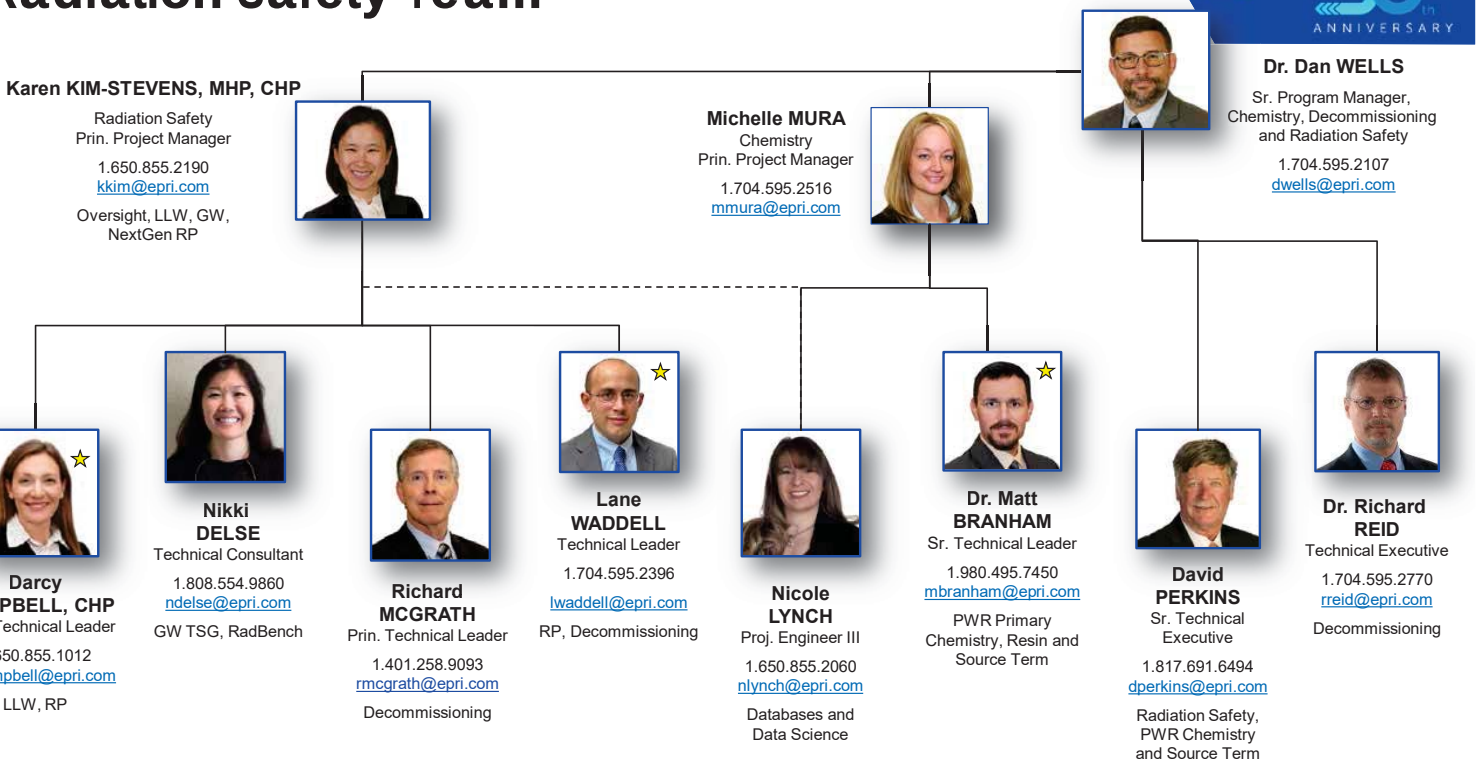
- **Radiation Monitoring**
- **ALARA Strategies and Technologies**
- **Effluent and Radwaste Minimization**
- **Source Term**



Fundamental – Stable Funding Model

SRMC – Standard Radiation Monitoring and Characterization

Radiation Safety Team



☆ New staff

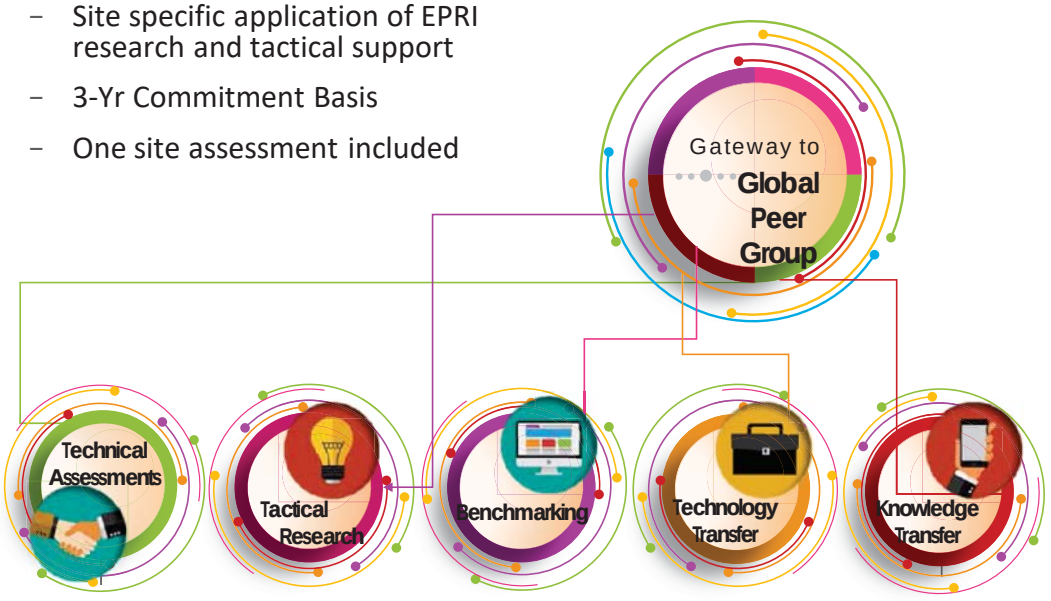
Radiation Safety – Technical Strategy Groups

Radiation Management and Source Term TSG
David Perkins, dperkins@epri.com

Low and Intermediate Level Waste TSG
Darcy Campbell, dacampbell@epri.com

Groundwater & Environmental Protection TSG
Nikki Delse, ndelse@epri.com

- **TSG Membership:**
  - Site specific application of EPRI research and tactical support
  - 3-Yr Commitment Basis
  - One site assessment included



Highlights

Select R&D Projects

Radiation Safety Strategic Focus

Modernization

- NextGen RP
  - Arial drones
  - Indoor positioning systems
  - Remote control LHR
  - SmearBot
  - Field monitoring teams

Advance the Science

- Co-58/60 impacts and control
- Ag-110m and radio-antimony behavior
- Cr-51 behavior and plant impacts

Data & Analytics

- Topical Hubs and RP for fuel cladding defects
- Databases and benchmarking

NextGen RP – Vision

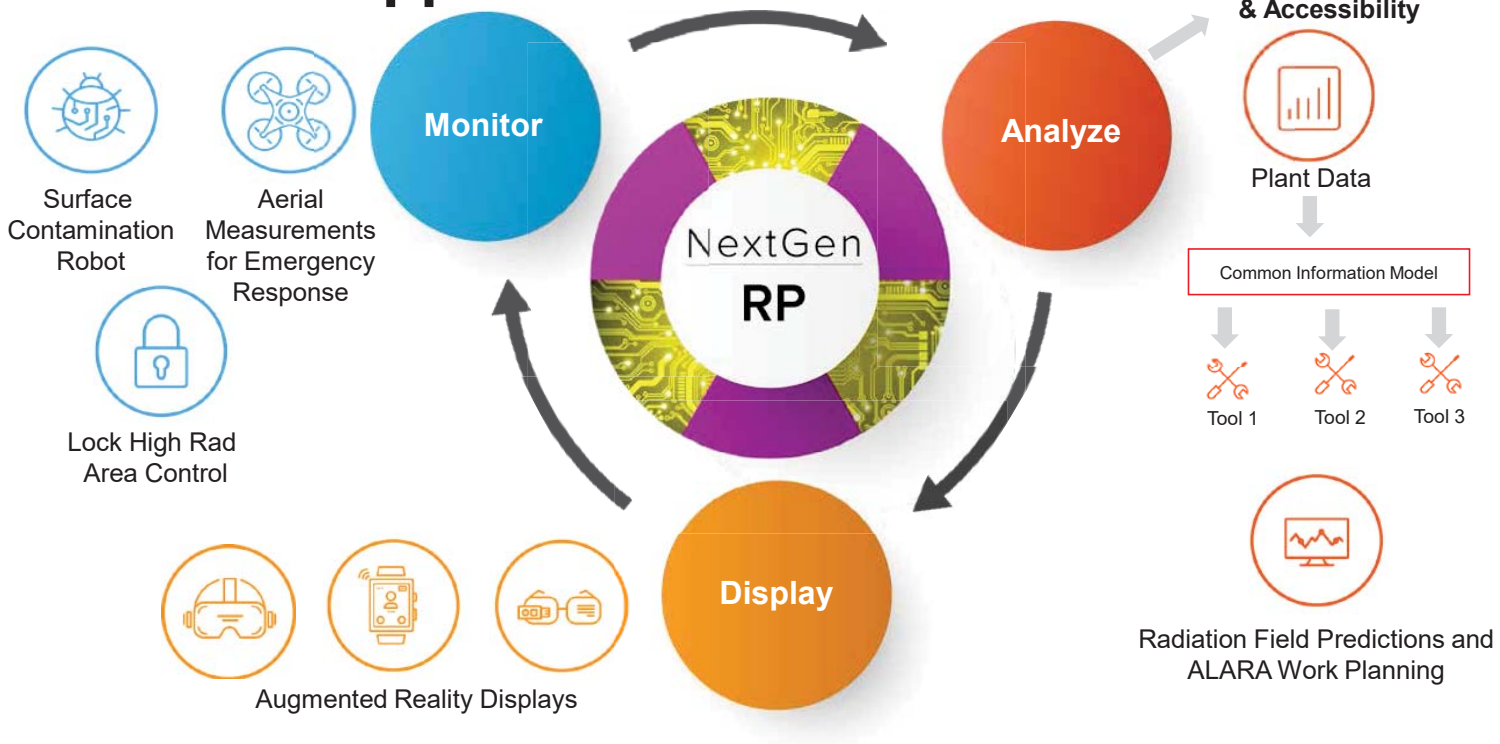
Radiation protection departments streamlined and focused on high-risk radiological protection activities

Where possible, tasks are conducted by remote, centrally located radiation protection technicians

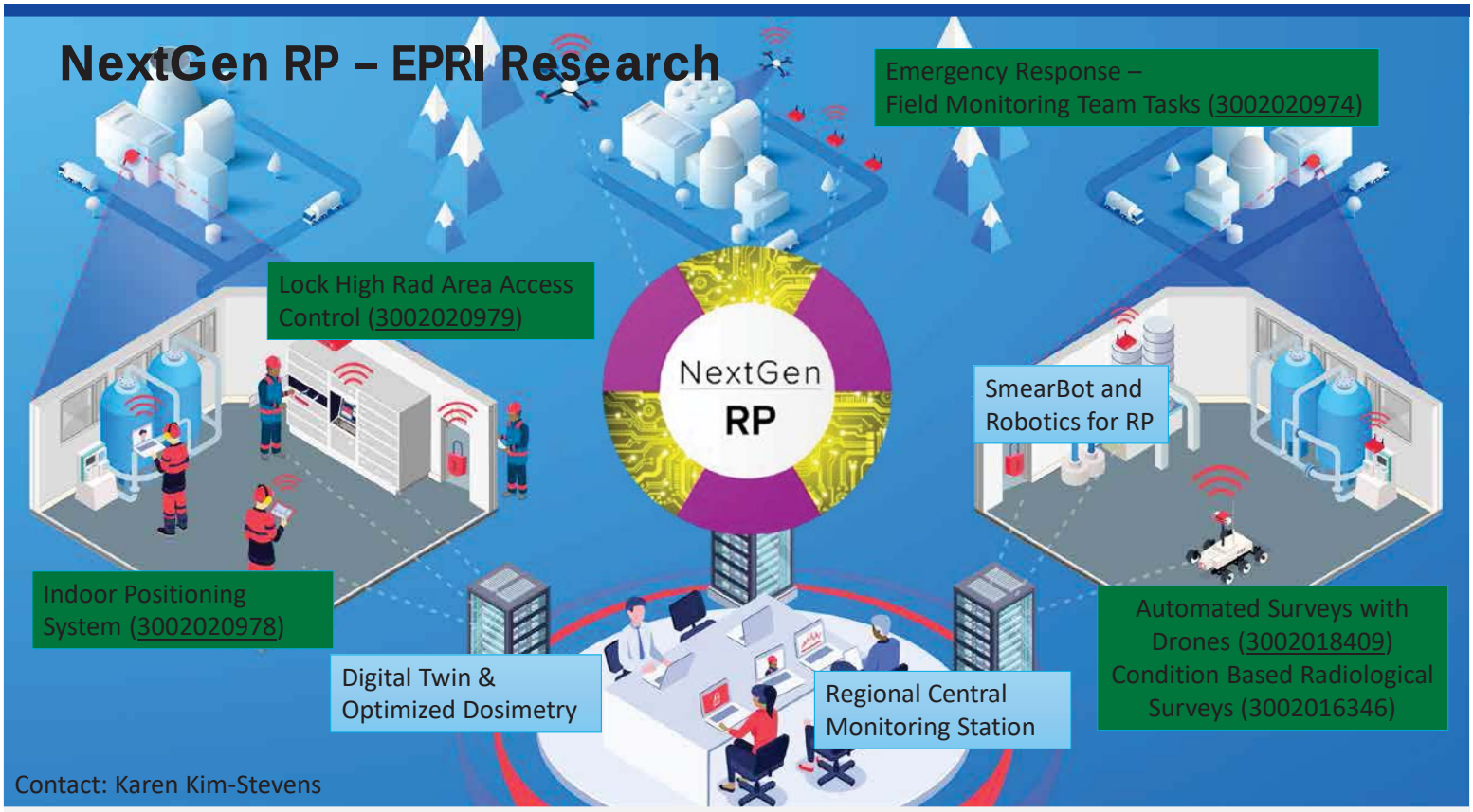
Centrally located Radiation Protection Control Rooms (RPCR) conduct and monitor efforts for one specific site/utility, multiple sites, or the industry

Goal: Support optimization of RP operations remote tools and risk-based planning

R&D to this support this vision



NextGen RP – EPRI Research



Contact: Karen Kim-Stevens

Indoor Positioning System (IPS) Demonstrations

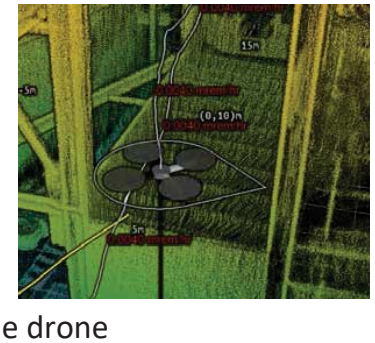
- Demonstrations of two IPS systems conducted inside containment at:
  - Braidwood (Fall 2019) – BLE based Quuppa
  - Vogtle Plant (Spring 2020) – UWB based Mirion Orion Real Time Locating System (RTLS)

- Key Takeaways:
  - Gathered installation experience
  - Track tags to ~1-2 meter accuracy
  - Generate live dose rate maps
  - Monitor entry in and out of areas
  - Communication with workers is essential

Results in EPRI Report 3002020978

EPRI Demonstration of Autonomous Indoor Drone at Peach Bottom

- Demonstrations conducted at Peach Bottom (PB) site in 2019:
  - In permanently shutdown PB Unit 1 and Peach Bottom Radwaste Building
- Simulated tasks performed without operator control (i.e., autonomously):
  - Mapping of Primary Auxiliary Building
  - Transit to pre-programmed waypoint locations
  - Surveys for area dose rates and results overlaid on a 3D map created by the drone
  - Camera Inspection of plant systems, structures and components (SSCs)
  - Searches for steam leaks
  - Safely avoided unexpected obstacles/intruder
- EPRI Deliverables 3002018409 and Narrated video on YouTube : https://youtu.be/97lyDoAOif4



Remote Control of High Radiation Areas

- Positive control of the entry points to high radiation areas is a regulatory requirement
- Current typical practice is for Radiation Protection to control dedicated keys and unlock the gates at entrances in person
- Practice is highly manpower intensive, especially during outage periods
- 2020-2021 explore and identify technologies and experiences
- Technical Report [3002020979]

Contamination Survey Robot

- Goal: Reduce frequency of manual, routine contamination surveys
- Develop specifications for a cost-effective robot that can
  - Perform contamination surveys following autonomous routes or user defined routes.
  - Determine and map the total area surveyed and calculate the removeable contamination levels in that area.
  - Specifications for Basic Floor Model, Middle End Model, High End Model developed.
- Close gap identified in RMT for Routine Surveys project.
  - See *Application of Remote Monitoring Technologies (RMT) to Risk-Inform Condition Based Radiological Surveys* (3002016346, 2019)

Photo Source: NextEra Energy at 2021 EPRI RMT Workshop

NextGen RP for Emergency Preparedness and Response

- Identified opportunities to implement modern technologies for RP tasks during Emergency Planning and Response (EPR)
- Business case analysis for implementing modern technology for Field Monitoring Team (FMT) tasks suggest significant value is possible (3002020974)
  - Passive monitoring network
  - Drones
  - Trucks with enhance radiation survey
- Implementation Guide for Enhancing Field Monitoring Team (FMT) Capabilities (2022-2023)

Graphic Source: Mirion presentation at the EPRI Plant Modernizations/RMT Workshop, June 2019

Graphic Source: OPG Darlington Presentation at the EPRI Plant Modernizations/RMT Workshop, June 2019

RP for Fuel Cladding Defects

Radiation Safety Hub

Radiation Safety Hubs

New Online Resource for Technology Transfer and OE Sharing (under development)

Technical Guidance
- Leverage EPRI Guidelines and Sourcebooks

References
- Enhanced search of EPRI research results and potentially others in the future

Utility Operating Experience
- Ability for utility members to submit and share operating experiences

Practical Resources
- Contacts, Software links, Training links

Current Content Focus

- Radwaste Characterization
- **RP for Fuel Cladding Defects**

New Efforts

- Primary to Secondary Leak
- Shipping and Transportation
- Source Term (TSG funded)

Project Manager: Radwaste – Darcy Campbell, RP – Karen Kim-Stevens

Radiation Protection Practices with Fuel Cladding Defects

Four types of fuel cladding defect conditions are discussed

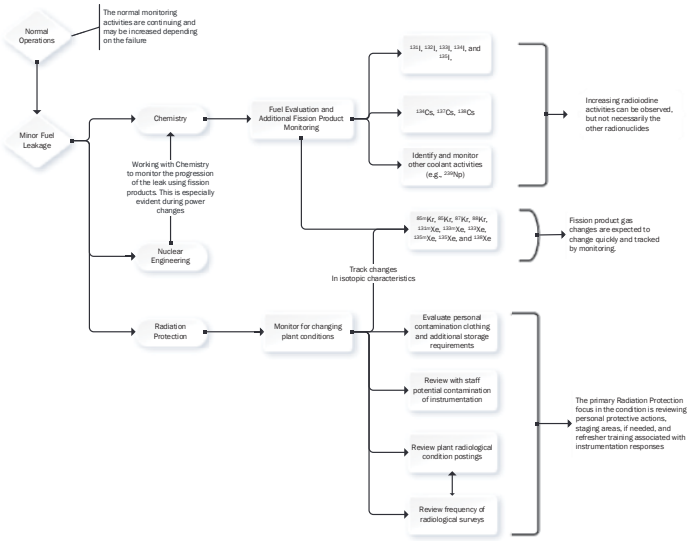
Stage 1 - Minor Leak – tight defect	
Stage 2 - Minor Leak – tight leak with the release of fission product gases	
Stage 3 - Minor leak – with changing radiological conditions	
Stage 4 - Major Leak – degraded conditions	

Where:

Tight defects:	May have limited RP challenges early in the defect formation up to changing radiological conditions as the defect opens
Open Defects:	The potential for significant radiological condition impacts

- Short- and long-term considerations for Radiation Protection
  - Increased RCS and/or Spent Fuel Pool activity, which can cause:
    - Elevated dose rates, airborne activity, higher levels of loose surface contamination including higher energy beta particles and alpha contamination, and fuel fragments/discrete radioactive particles (DRPs)
  - Results in potential:
    - Increased station dose, personal contamination events (PCEs), potential for unplanned exposures, survey frequency/complexity, etc.
- Programmatic considerations
  - Monitoring and control programs
  - Personnel monitoring
  - Respiratory protection
  - Other consideration

Radiation Protection Practices with Fuel Cladding Defects



RP Practices with Fuel Cladding Defects:

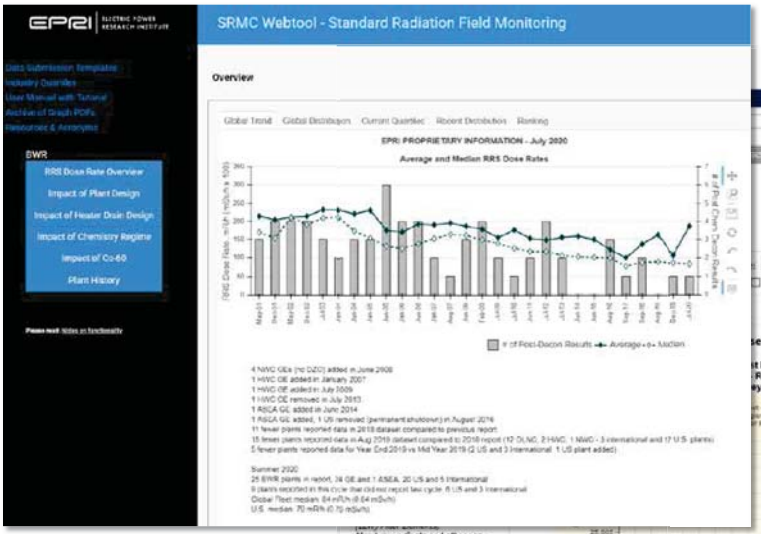
- Is intended to capture:
  - Online, outage, and spent fuel dry cask storage radiation protection aspects considering a risk-based approach.
- Provide a reference of activities across multiple areas that can impact radiation protection
  - Samples and monitoring,
  - Alpha contamination,
  - Airborne activity challenges including noble gases and iodine controls,
  - Waste management issues and challenges, and
  - Personnel monitoring.

Radiation Safety Hub Status

- The project is proceeding and on track
- Additional Topics or considerations for the product?
- Additional information to provide?
  - Procedures
  - Operating Experience including CAP documents
  - …
- Next Steps
  - Collect operating experience and procedures
  - Develop White Papers and playbook
  - Continue work on the Radiation Safety Hub (interactive) functionality

Radiation Safety Databases and Benchmarking

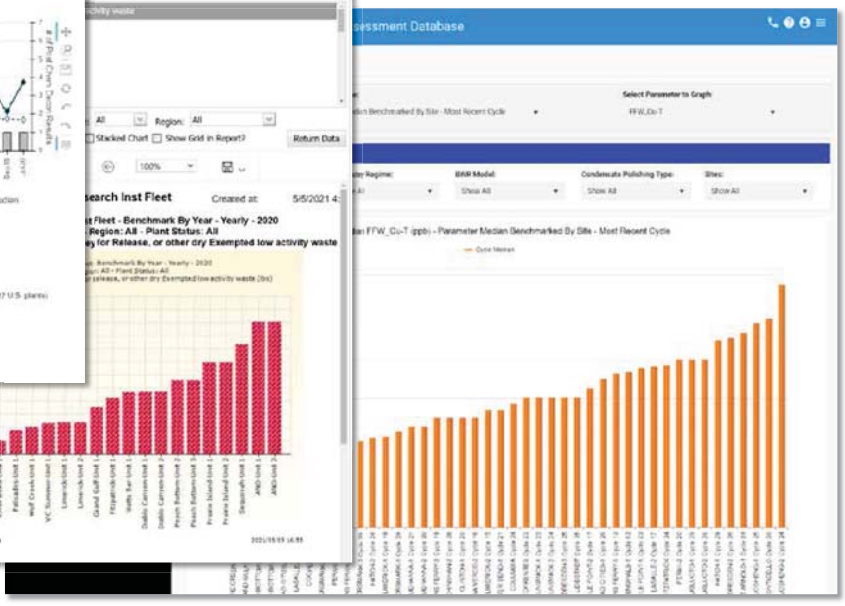
Database Web Applications



SRMC Web, V (3002015914),
https://srmc.epri.com

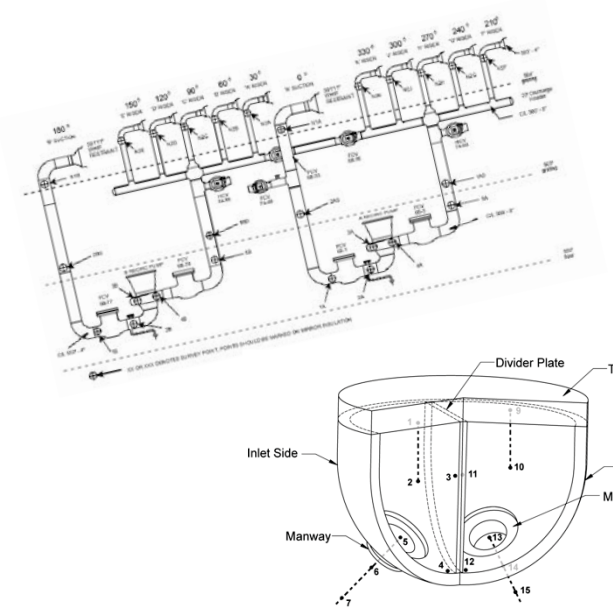
RadBench, V 3.4 (3002003994),
https://radbench.epri.com

CMA Web, Version 4.0 (3002017886),
https://cma.epri.com



Standard Radiation Monitoring and Characterization (SRMC) Overview

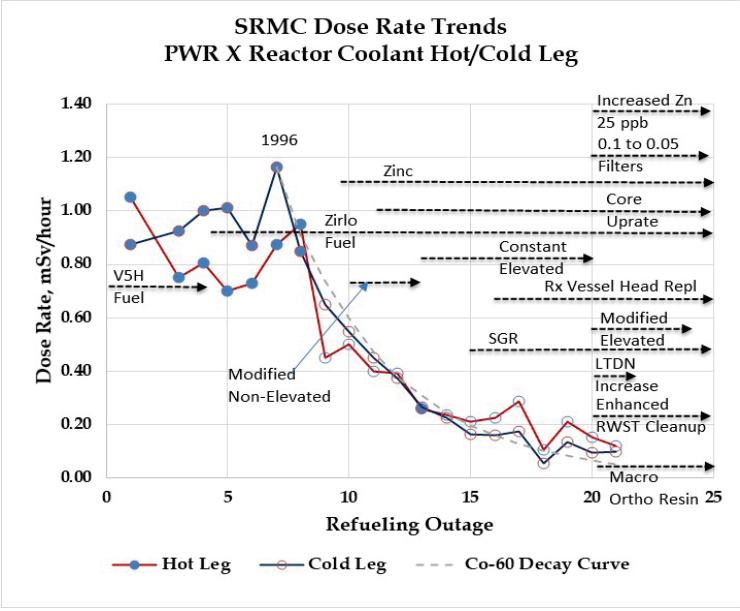
- SRMC is the only cross design, ***global radiation field data benchmarking program***
- Data is vital for EPRI source term reduction research, assessments, and member benchmarking.
- SRMC is one unified program, a continuation of BRAC (BWR) and SRMP (PWR) and is expanding
  - to other and new designs,
  - to new technologies while linking to traditional, and
  - to enable up to date analysis, research, and visualization tools
- SRMC value lies in member participation, benchmarking, and derived data-driven research results and their industry implementation



Best of All: SRMC is now accessible online – https://srmc.epri.com

Application of SRMC Data

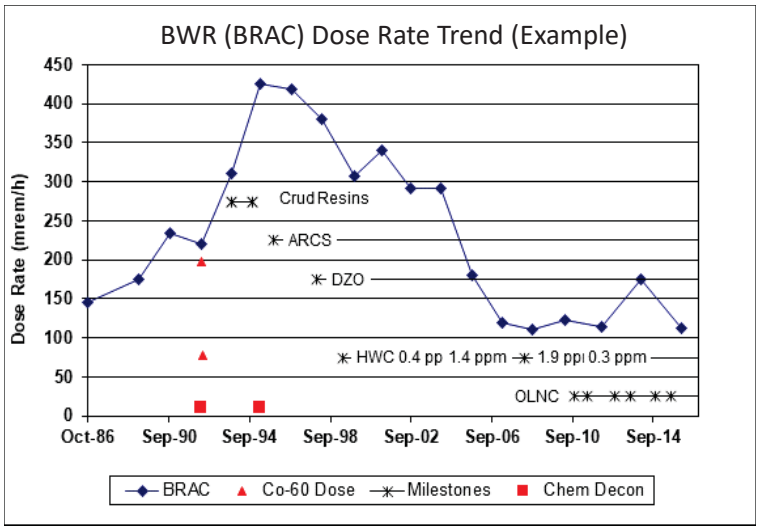
- Used in all many assessments (i.e., Source Term Assessments, ALARA Assessments.)
- Use in member benchmarking requests comparing between similar plants
- Use in all past zinc application work for PWRs
- BWR data has been used most recently in a Co-60 to Zn ratio white paper



References:

Standard Radiation Monitoring and Characterization, https://srmc.epri.com

Standard Radiation Monitoring and Characterization
Long-term Unit Trends



- Source Term Challenges
  - Plants may respond differently
    - Different age, different material manufacturing times, etc.
  - Observations take time to be observed
    - As shown in the dose rate curves, the reduction of dose rates occurs over 20 years and, in this case, still slowly lowering
    - Depending on the source, radiation fields may or may not be impacted as expected
  - In many cases, collective radiation exposure (CRE) reduction is led by a ***STRONG*** station ALARA program.

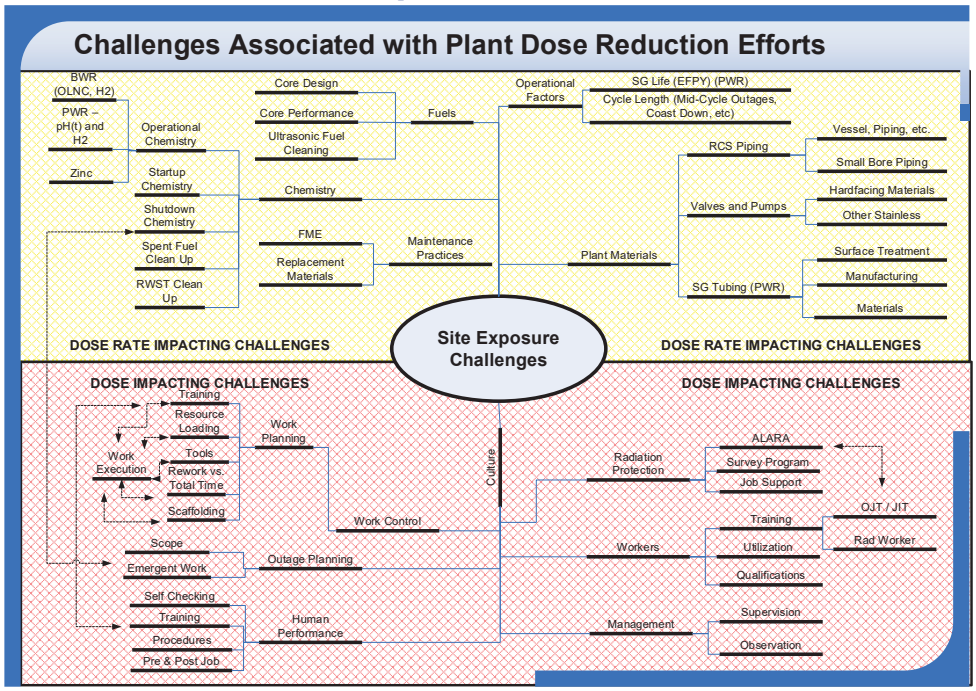
References:

Standard Radiation Monitoring and Characterization, https://srmc.epri.com

Source Term Reduction

Source Term and Dose

Interconnected, but Separate

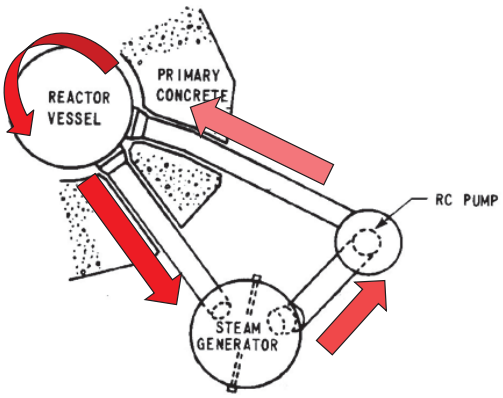


- Management of source term support reducing radiation fields
  - Significant multi-factor issue
- Management of dose requires control of scope (time in field) also

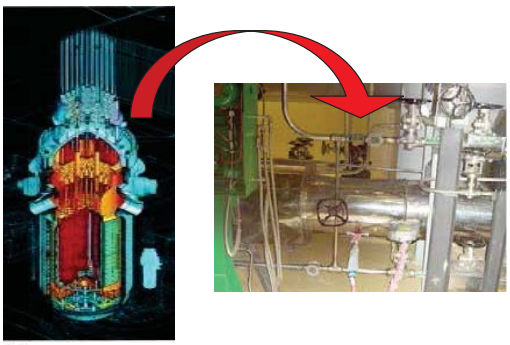
Coolant Activity and Deposition

A Two-Phase Issue

1. During operation activity incorporation into surface oxides appears governed by soluble species
2. Particulate dropout in dead legs or low fluid shear regions will increase local dose rates



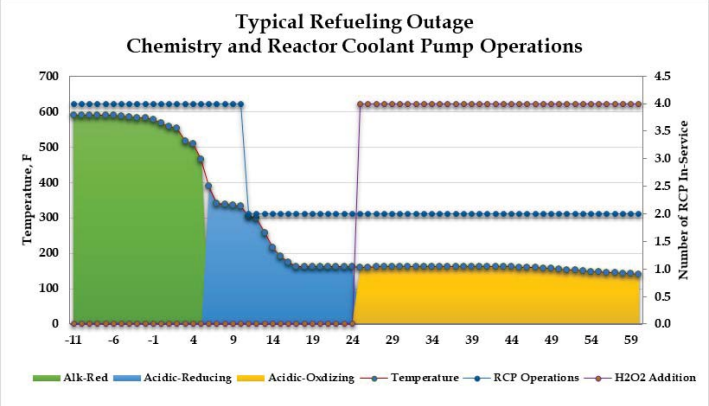
During Operation – Soluble



During Shutdown – Particulate

Source Term and Shutdown Chemistry Controls

- Primary objective of shutdown chemistry control optimization
  - *Prepare the reactor coolant system for safe head lift and refueling cavity flood up as quickly as is practical following breaker trip*
  - It is not a chemical decontamination process, is but designed to:
    - To control where possible the release of activity from the core:
      - In both soluble and particulate forms
      - To provide for efficient clean up of such releases
  - **Objective is to not adversely impact personnel dose and outage critical path**

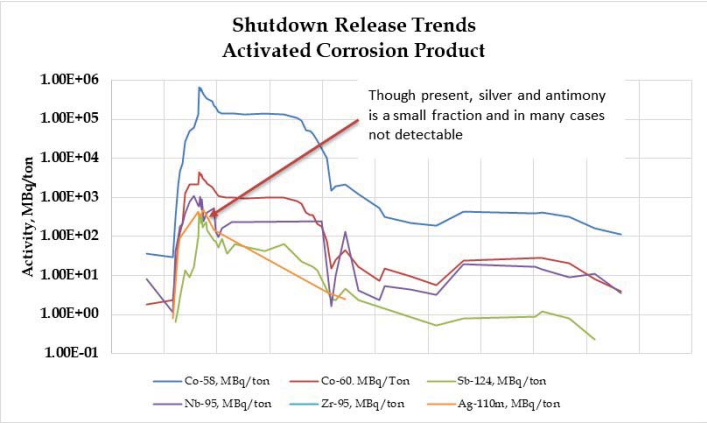


- Shutdown Chemistry:
  - Transitioning the reactor coolant to acidic-reducing conditions
  - Maintain hydrogen inventory
  - Minimize the number of hydraulic transients (e.g., reactor coolant pump operations)
  - Add hydrogen peroxide to transition the reactor coolant to acidic-oxidizing conditions
  - Cleanup released materials

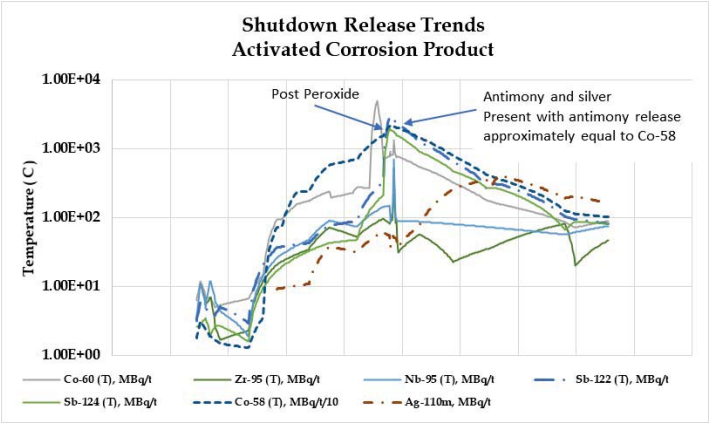
Source Term and Shutdown Chemistry

A Tale of 2 Units with one dominated by Co-58 and the other Ag-110m and radioantimony

Minimal Antimony and Silver



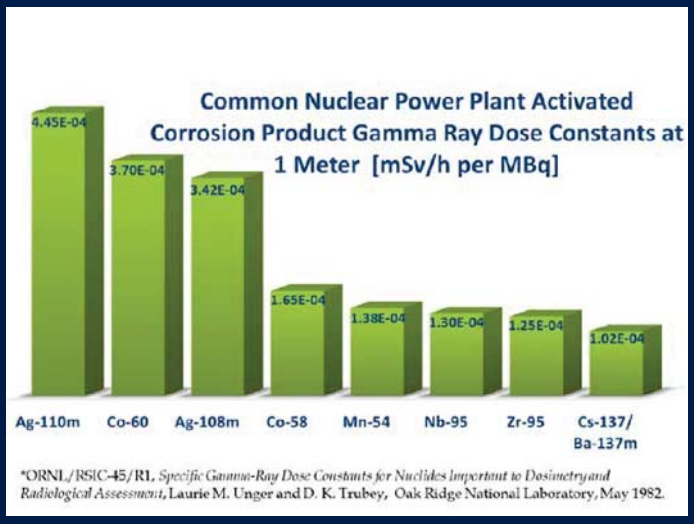
With Antimony and Silver Contamination



Antimony and silver deposition risk?

Trace Amounts of Silver Can Cause Significant Changes in the Radiation Field

- Silver can create dose rates 5 – 11x higher than Cobalt from equal amounts of elemental ingress mass because silver:
  - Has Neutron capture cross section is ~3x larger, and Half-life is ~8x shorter, thus Reaches higher activity levels faster.
  - Silver's larger activity-dose conversion factor amplifies the effect on dose rates.
- Sources including control-rod absorber materials, reactor pressure vessel head seals, valve and pump seals and others



Is Silver Observed by the Industry, Globally-Universally?

	Plant Type	Components/Areas with documented Ag-110*m* dose rate/activity contribution	Approx. Maximum Ag-110*m* Contribution to Dose Rate
Pressurized Water Reactor			
	B&W	Make-Up Pump	N/A (1.4 R/h at contact [14 mSv/h])
	CE	Piping of charging pump	94%[1] (~290 mR/h [~2.9 mSv/h])
	WEC 3-Loop	CVCS	80%[1] (~450 mR/h [~4.5 mSv/h])
	WEC 3-Loop	Non-regenerative heat exchanger	80%[1] (26 mR/h [~0.26 mSv/h])
	B&W	Auxiliary Building components	79% (~300 mR/h [~3 mSv/h])
	WEC 3-Loop	Non-regenerative heat exchanger	80%[1] (~140 mR/h [~1.4 mSv/h])
	Framatome 3/4-Loop	Heat exchanger, piping downstream of sampling and CVCS systems	90% (up to 1 R/h [10 mSv/h])
Boiling Water Reactor			
	ASES	Reactor water cleanup system, fuel pool cleanup piping	No impact
	GE BWR-4	Reactor water cleanup demineralizer inlet	40%[1] (105 mR/h [1.05 mSv/h])

Primary Impact in lower-temperature – Not large-bore, high-temperature coolant systems

[1] Silver-110*m* dose rate contributions were estimated based on available isotopic activity data and dose-activity conversion factors.

EPRI Effort Associated with Ag-110m

Completed Work

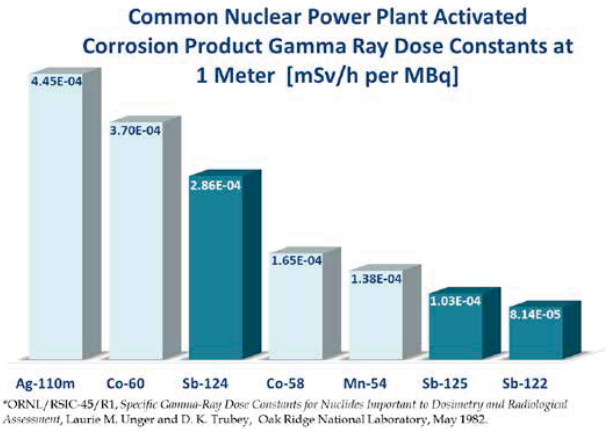
- *Quick Guide – Impacts of Silver and Ag-110m on Radiation Field Generation* (3002014501, 2019).
- *Exploration of Fundamental Silver Chemistry and Behavior under Select Nuclear Power Plant Primary Coolant Conditions* (3002015910, 2020).

New efforts (2023 proposal)

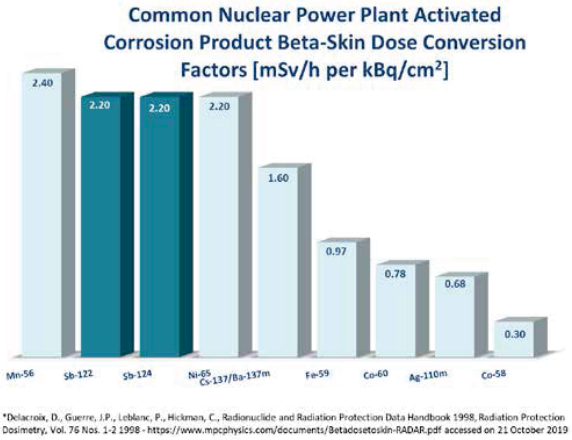
- How can activated silver, Ag-110m, effectively be removed through operational, shutdown, or startup practices from the primary coolant and prevented from depositing on system surfaces?
- Scope
  - Collect and review additional operating experiences
  - Benchmark collected data – identify commonalities and difference
  - Identify successful strategies and verify against fundamental silver behavior
  - Vet identified strategies with small member working group
  - Develop approaches/good practices that lead to silver-110m contamination reductions

Why is Antimony Important?

- In particular, ^{124}Sb ($t_{1/2}$ = 60 days) has high energy gamma and beta
- Sb can be difficult to remove with conventional ion exchange resin
- Sb-selective media have been used
  - Radwaste applications
  - Evaluate for compatibility with CVCS/RCS



*ORNL/RSIC-45/R1, *Specific Gamma-Ray Dose Constants for Nuclides Important to Dosimetry and Radiological Assessment*, Laurie M. Unger and D. K. Trubey, Oak Ridge National Laboratory, May 1982.



*Delacroix, D., Guerre, J.P., Leblanc, P., Hickman, C., Radionuclide and Radiation Protection Data Handbook 1998, Radiation Protection Dosimetry, Vol. 76 Nos. 1-2 1998 - https://www.mpcphysics.com/documents/Betadosetoskin-RADAR.pdf accessed on 21 October 2019

Graphs above included in EPRI 3002015912

US and Non-US Operating Experience with Antimony

Secondary Startup Sources

Plant Type	Affected System	Approximate Contribution to Dose Rate
PWR WEC 4-Loop	RHR and CVCS, reactor building air, radwaste	20,000 mR/h beta dose rate 1000 mR/h gamma dose rate [at shutdown peak instead of typical peak of 500 mR/h] 10% MPC airborne Sb [2E-09 mCi/cc] Coolant ^{124}Sb peak activity: 3E-02 mCi/mL
PWR WEC 4-Loop	CVCS	50% increase, ^{122}Sb and ^{124}Sb identified in coolant
PWR WEC 3-Loop	Letdown system	Increase from 40 to 78 mR/h gamma dose rate in less than 1 hour, with max of 90 mR/h over a 2.5-hour duration ^{122}Sb and ^{124}Sb (7.93E-02 mCi/mL and 3.16E-02 mCi/mL, respectively)
PWR WEC 3-Loop		Radiation field surveys higher than previous outage; ^{122}Sb [20 Ci/m^3] and ^{124}Sb [11 Ci/m^3] identified
PWR WEC 3-Loop	Spent fuel pool	High fraction of activated Sb in radioactive liquid effluents
PWR CNP 3-Loop		Sb activity detected in coolant

Quick Guide: Impacts of Antimony and Sb-124 on Radiation Field Generation: Review of Operating Experiences. EPRI, Palo Alto, CA. 2019. 3002015912.

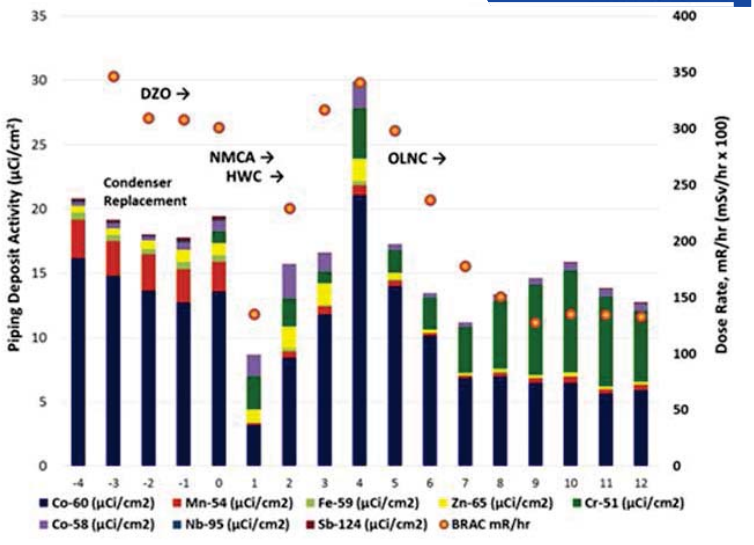
Antimony Research

- Antimony chemistry is complex
  - Found in > 100 natural minerals
  - Has two main oxidation states (Sb(III) and Sb(V)) and forms oxyanions
- Testing
  - Effect of solution matrix (B, Li, Zn, H_2O_2), component concentrations, and temperature on behavior
    - Conducted at low temperature to represent cooler parts of RCS
  - Solubility
  - Adsorption/deposition on untreated and pre-oxidized metal coupons (304SS, carbon steel)
- Testing has been completed; evaluation of results is in progress

Cr-51 Impacts

Chromium (^{51}Cr) Releases

- Events associated with releases of crud with high ^{51}Cr content have impacted outage critical path and created radiological hazards
- Not typically radiological challenge
- BWRs
  - Highest ^{51}Cr activity releases during shutdown (hydrogen secured)
  - Piping surface deposits
- PWRs
  - Significant ^{51}Cr activity releases during shutdown → unanticipated events during steam generator inspection
- Other reactor designs?



High Activity Releases in PWRs

Consequences of high particulate release

- Increased coolant cleanup time
- Elevated dose rates overall and in low flow areas
- Elevated smearable activity
- Increased wear of SG eddy current probes
- Release of activity during SG inspections
- Increased personnel contamination events

Known U.S. PWRs cycle featuring high particulate activity fractions

- McGuire 1 – 2004*
- South Texas Project 1 – 2005*
- Callaway – 2011
- Palo Verde 1 – 2016

*See EPRI report 1016766, 2008 for more details

This type of event can lead to fundamental changes in shutdown operations.

Current Chromium Impacts Project

- Objectives
  - Attempt to identify common causes for industry experiences
  - Identify gaps and prioritize for further investigation toward mitigation strategies
- Approach
  - Review and classify industry experiences with respect to commonalities and differences
    - Previous EPRI reports
    - Reactor coolant activity trends (CMA), piping dose rates (SRMC), and gamma scan data (SRMC)
    - Industry survey
  - Document insights and gaps in understanding
- Value
  - Results anticipated to
    - Assist in more efficient chemistry and radiation safety controls
    - Provide better understanding of risks for encountering significant Cr-51 releases or contamination
    - Assist in minimization of impacts of radiological events on outage critical path

Engaging with EPRI

Radiation Safety Engagement Opportunities

- Project Working Groups – Rad. Safety Hub, NextGen RP, etc.
- Groundwater Guideline Revision Committee
- SRMC Revision Working Group
- Periodic Industry Meetings
- TSG Topical Assessments
- Support R&D Portfolio Development

If you have interest in a specific topic, please contact the project leader directly

Training Opportunity: General Radiochemistry for PWRs

- **When: 18-22 July 2022**
- Where: EPRI Charlotte
- Registration Deadline: 4 July 2022
- Target Audience: This course is targeted towards chemistry and radiation protection staff involved with counting room operations, primary water chemistry programs, and primary-to-secondary leak rate programs.
- What: Four distance learning modules addressing the following main topics: (1) Fundamentals of radiochemistry (2) Evaluation of coolant fission product activity in the evaluation of fuel cladding performance (3) Description and understanding coolant and corrosion product activation, (4) Application of radiochemistry principles in the day-to-day operations
  - Each session is designed to be between 1 and 1 ½ day course through a total of four sessions. This course is targeted towards chemistry and radiation protection staff involved with counting room operations, primary water chemistry programs, and primary-to-secondary leak rate programs.
- Details and Register for Training [epri.csod.com]

Contact David Perkins (dperkins@epri.com) for more information.

Plenary sessions
Panel sessions
Breakout sessions
External thought leadership
Demos and lab tours

Digital Worker
SIF Mitigation
Safety by Design
Emerging Grid H&S Impacts
Human Performance
Safety Culture

Register at https://cvent.me/gmbwYo

Radiation Safety – Technical Strategy Groups

Radiation Management and Source Term TSG

David Perkins, dperkins@epri.com

Low and Intermediate Level Waste TSG

Darcy Campbell, dacampbell@epri.com

Groundwater & Environmental Protection TSG

Nikki Delse, ndelse@epri.com

Radiation Management and Source Term Technical Strategy Group Workshop

- The workshop is planned for four areas within the Radiation Management and Source Term Technical Strategy Group: (1) ALARA Programs and Best Practices (2) Source term reduction and control technologies (3) Update on Shielding application and technologies, (4) Application of remote monitoring technologies in the day-to-day operations
- Target Audience: This workshop is targeted towards chemistry and radiation protection staff involved with source term and ALARA, shielding, and remote monitoring technologies.
  - Open to all members (no fee for RM&ST TSG funders)
  - Vendor space is also available (nominal fee applies)
- **When and Where: 27-29 September 2022, EPRI Charlotte**
- **Registration Deadline: 2 September 2022**

Common Radiation Protection Initial Training Curriculum

Common Fundamentals

101 | Common Industry Fundamentals

102 | Common Academic Fundamentals

Nuclear Fundamentals

113| Common Nuclear Industry Fundamentals and Systems

Radiological Fundamentals

211 | Radiological Principles

212 | Radiological Sampling

213 | Count Room

OPTION: Break for OJT/TPE on Sampling/Analysis Tasks at Utility

Radiation Protection Knowledge

321 | Junior Tasks Knowledge

331 | Senior Tasks Knowledge

332 | Advance Tasks Knowledge

Complete site-specific & OJT/TPE at Utility

Contact: Tim Slayton, tslayton@epri.com

EPRI ELECTRIC POWER RESEARCH INSTITUTE

Revision of EPRI Groundwater Protection Guidelines

Need for Revision

- Revision 1 of EPRI Groundwater Protection Guidelines published in 2013 (EPRI Report 3002000546)
- Since 2013, new industry operating experiences, lessons learned, and EPRI research
- For U.S. plants: NEI 07-07 revised in 2019 based on 10 years of industry experience
- Opportunity for knowledge transfer and re-enforcing importance of groundwater protection programs at nuclear power plants

Revision Process

- Convene Groundwater Guidelines Committee
  - First Committee Meeting will be held June 30, 2022 in conjunction with the Radiological Effluents & Environment Workshop (REEW)
    - Virtual Participation Option Available
- Collate and analyze industry events and experiences since 2013
  - EPRI Groundwater Assessments
  - Reports to INPO/WANO, NEI, and NRC
  - Committee experiences
- Revise & Publish Guidelines
- If needed, develop public version of Guidelines for regulatory review
- Project Timeframe: 2022-2024

Project Manager: Karen Kim-Stevens (kkim@epri.com)

2023 - 2024 Radiation Safety Portfolio Proposals

Projects in Prioritization Package (FOR INFORMATION)

Radiation Monitoring

- NextGen RP: Normal Operations (2020 – 2025)
- NextGen RP: Emergency Preparedness and Response (2021 – 2025)
- SRMC Revision (2021-2023)

ALARA

- Radiation Safety Hub (2022-2024)
- Aspects of Radiation Safety for Advanced Nuclear Reactors

Effluent and Radwaste

- Radwaste Hub (2019 – 2024)
- KOH (ongoing)
- Radwaste Processing: Resins for Ni-63 (2022-2023)
- Estimation of Tc-99 and I-129 (2021-2023)
- NextGen RadWaste
- NextGen Effluents

Source Term

- Particulate Transport Impacts (2020-2023)
- Control of Cr-51 (2022-2024)
- Silver Mitigation (2023-2024)
- Impact of Adv. Fuel
- BWR Hydrogen Injection Rate and Dose Rates
- Reevaluation of PWR Zinc Impacts

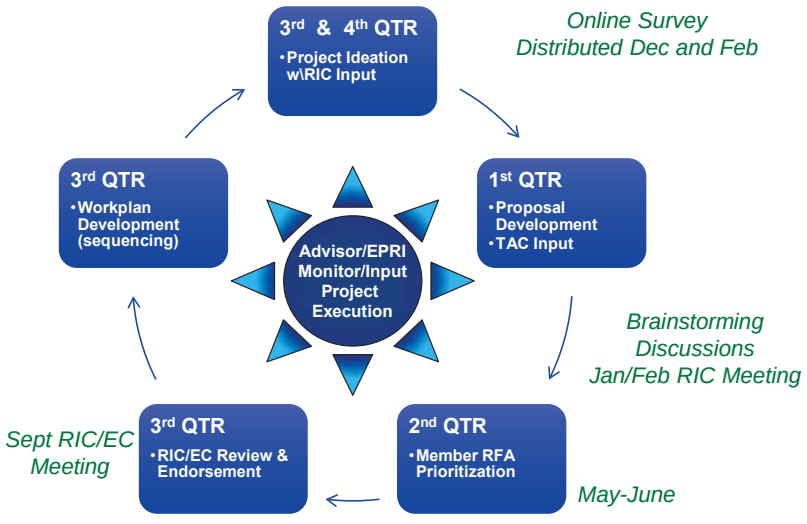
Funded | New Proposal

2023-2024 R&D Portfolio Development

2022 Prioritization Schedule

- May 24: Prioritization package distribution
- June 1 (Chem) & 2 (RS): webcast discussions of package and projects
- June 17: Prioritizations due back to EPRI
- Week of 12 September: RIC meeting – Virtual and Boca Raton, FL, USA

Target Operational Rhythm



Feedback is essential to EPRI meeting the needs of our members

EPRI Chemistry and Radiation Safety Utility Member Feedback

Survey Monkey Tool – Online (One per utility – coordinate with Primary Advisor)

Member Feedback - Numeric

Radiation Safety Research Focus Area (RFA)	Feedback (1, 2, or 3) 1 = high
Rad. Monitoring	?
ALARA	?
Effluents and Radwaste	?
Source Term	?

- Numeric feedback combined together and used by EPRI to determine relative priority of each RFA

Member Feedback Qualitative

- After numeric feedback is provided
  - Comment area available for qualitative feedback - importance of specific projects, identification of absent topics, other feedback
- Qualitative feedback used by EPRI to determine relative priority of projects

Feedback requested by 17 June 2022 in support of 2023-2024 Portfolio Development

LASALLE INNOVATION

Joe Jaegers
June 21st, 2022

1

UNIQUE CHALLENGES

Very high source term

- Non-tenacious crud
  - High iron in earlier operating cycles
  - Mobile
- High cobalt inventory
  - Catastrophic failure of reactor recirc flow control valves
    - Activated stellite
      - Piping systems to 300,000 mr/hr
      - Particles > 15,000,000 mr/hr

Equipment

- Design challenges
  - RWCU system
    - Elbows
    - Dead legs
  - Recirc system
    - Valves

2

UNIQUE SOLUTIONS

New technologies

- High efficiency ultrasonic fuel cleaning
- All metal filter modules
- Laser ablation
- Radvision 3D scanning
- Vocera
- Robotic cleaning of sumps and cavity

Adapting/evolving existing technologies

- Internal and external ultrasonic component cleaning
- Smart swing gates
- System cleaning/flushing
- Gamma scanning and mapping

3

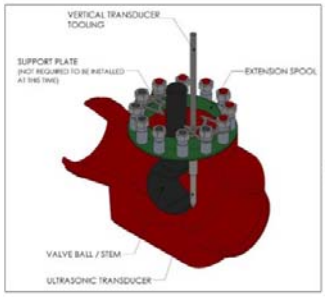
RECENT SOLUTIONS

Internal component ultrasonic cleaning

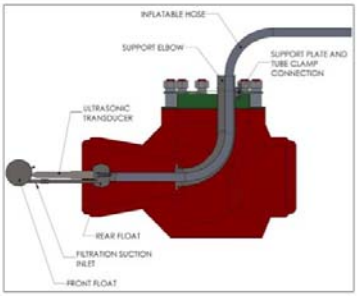
4

RECENT SOLUTIONS

Internal component ultrasonic cleaning



Tooling for cleaning of valve interior
(before removal of ball/stem)



Tooling for cleaning of valve & piper interior
(after removal of ball/stem)

Also used to clean valve internals after removal

5

RECENT SOLUTIONS

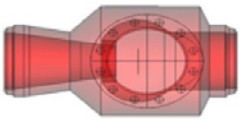
Internal component ultrasonic cleaning

FCV – 60A Dose Reduction

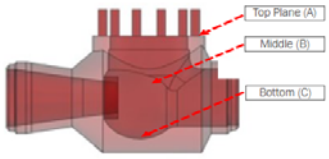
Survey Location	Location ID	Contact Dose Rate (R/h)		Dose Reduction
		Before Cleaning	After Cleaning	
Top plane of valve body	A	4	1.7	57.5%
Middle of inside of valve body	B	10	6	40%
Bottom of inside of valve body	C	15.5	6.5	58%
General area of platform at valve	D	.50	.15	70%

FCV – 60B Dose Reduction

Survey Location	Location ID	Contact Dose Rate (R/h)		Dose Reduction
		Before Cleaning	After Cleaning	
Top plane of valve body	A	3.7	1.7	54%
Middle of inside of valve body	B	14.8	5.7	61.5%
Bottom of inside of valve body	C	15.6	7.3	53%
General area of platform at valve	D	.43	.15	65%



Top View



Front View

6

RECENT SOLUTIONS

External component ultrasonic cleaning

7

RECENT SOLUTIONS

External component ultrasonic cleaning

Installation of ultrasonic transducer and clamp

Installed ultrasonic transducer and clamp

8

RECENT SOLUTIONS

External component ultrasonic cleaning

Location ID	Dose Rate at Install Location (mR/hr)		Dose Reduction	Avg. Dose Rate 6-10" Downstream (mR/hr)		Dose Reduction
	Before Cleaning	After Cleaning		Before Cleaning	After Cleaning	
1	145	18	88%	117	18	84%
2	150	35	77%	113	33	71%
3	190	50	74%	115	74	35%

9

RECENT SOLUTIONS

Gamma Reality Inc (GRI)

GRI-LAMP 3D Radiation Mapping

Real-time 3D map and radiation data streamed to user control tablet/phone

- Isotope specific maps
- High resolution LiDAR maps
- Proximity radiation mapping at ~1 m
- Available: High resolution gamma-ray imaging at ~10 cm scale
  Available: Dual gamma-ray and neutron mapping

Data processed and stored onboard system

Weight: 10lb or less (depends on integrated detector)

- Pictured: Gamma-ray imaging version

Battery life: ~1.5 hour active data collection (swappable)

10

RECENT SOLUTIONS

GRI

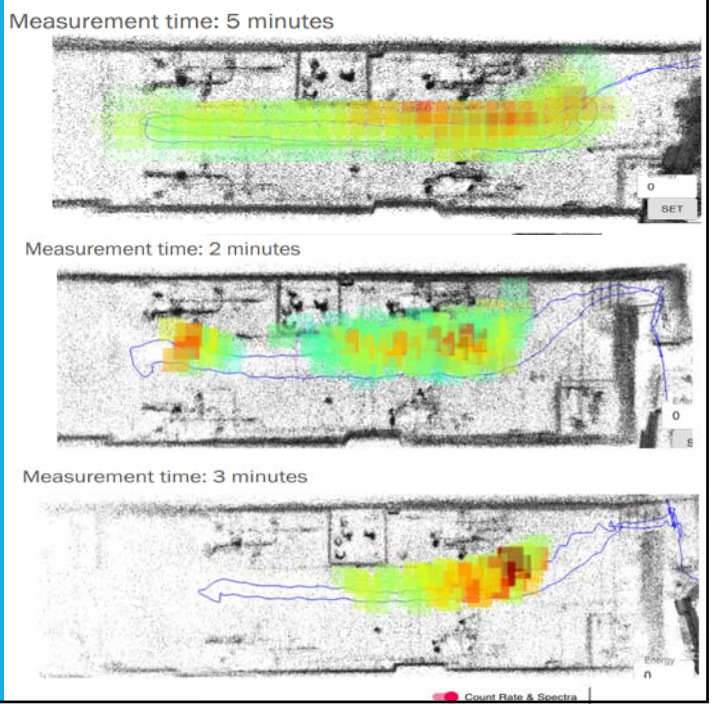
Deployment of GRI's mobile 3D radiation mapping technology

User interface for GRI's mobile 3D radiation mapping technology

11

RECENT SOLUTIONS

GRI



12

RECENT SOLUTIONS

Smart swing gates

13

RECENT SOLUTIONS

Smart swing gates

14

RECENT SOLUTIONS

RWCU Drain Line Chemical Decon

Goodway ScaleBreak SS was utilized as a radioactive decontamination agent for dose rate reduction of the 2REL9A drain line of the 2PL14J Reactor Water Sample Panel. A 10% chemical solution was utilized with a 45-minute contact time. Post decon survey results of this innovative, first-time application indicate an average of 50.75% reduction in general area dose rates around the drain path. This initiative was driven by Chemistry through the LaSalle DIRT team, tracked daily on the station POD as a near-term dose-reduction initiative, and executed by a cross-functional team comprised of Chemistry, Operations, FIN, and Radiation Protection.

15

RECENT SOLUTIONS

RWCU Drain Line Chemical Decon

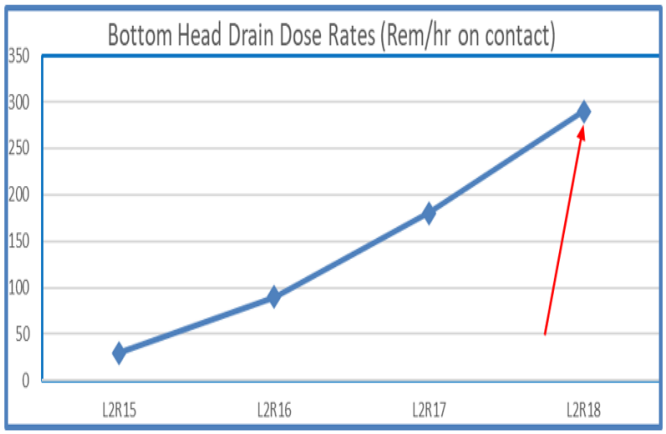
The reduction in general area dose rates is significant and will impact all work activities and departments performing work in the following areas:

- 2RB761 by B DPU reduced from 12-46 mRem/hr to 6-12 mRem/hr
- 2RB761 by 2PL77J panel reduced from 17-33 mRem/hr to 10-11 mRem/hr
- 2RB740 at the U2 Rx Building elevator reduced from 22 mRem/hr to 9 mRem/hr
- 2RB710 from Rx Building elevator to the Chemistry corridor airlock reduced from 2-5 mRem/hr to <1-2 mRem/hr
- 2RB694 Raceway from the HPCS corner room to the A RHR corner room reduced from 5-12 mRem/hr to 3-6 mRem/hr

16

UPCOMING CHALLENGES

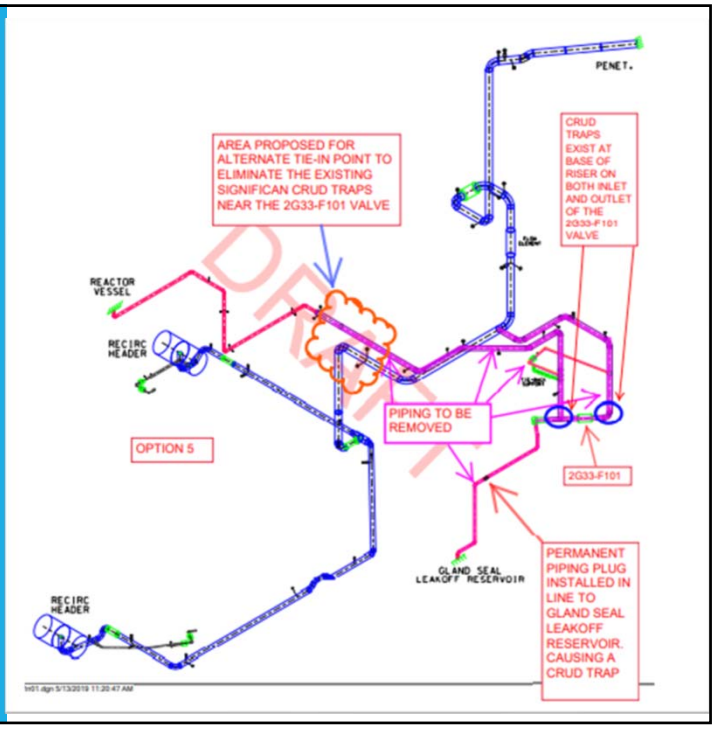
38 RWCU FAC INSPECTIONS
12 RR/RWCU SNUBBERS
RECIRC ISOLATION VALVE MODIFICATION
I/B RWCU ISOLATION VALVE PART 21
RWCU DISCHARGE CHECK VALVE REPLACEMENT
BOTTOM HEAD DRAIN REPLACEMENT



17

UPCOMING CHALLENGES

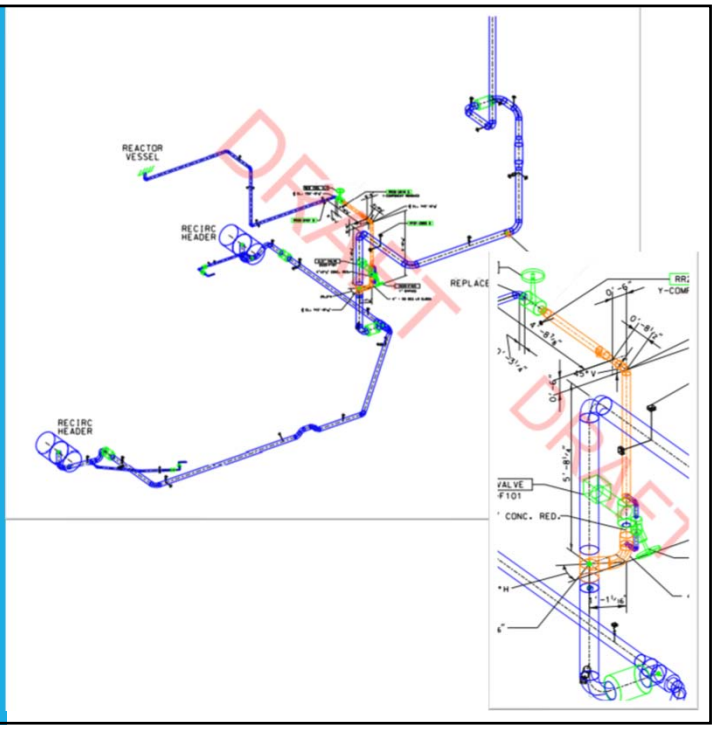
CURRENT BOTTOM HEAD DRAIN DESIGN



18

UPCOMING CHALLENGES

MODIFIED BOTTOM HEAD DRAIN DESIGN



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QUESTIONS

20

RP-ALARA Association

PLANT STATUS REPORT QUESTIONAIRE – Year_2022_

STATION: Braidwood
UTILITY: Constellation
Prepared By: Joe Coughlin

	CYCLE #	Previous Year ON-LINE DOSE (Rem-DLR)	RWP person hours	ONLINE Level 2&3 PCE'S
UNIT 1	22	1.372	-	1
UNIT 2	22	1.584	-	0
UNIT 3				
UNIT 4				

	LAST REFUEL OUTAGE EXPOSURE ESTIMATE / ACTUAL (Rem-DLR)	DURATION ESTIMATE / ACTUAL	Level 2&3 PCE's
UNIT 1	28Rem/31.578Rem	18day 15hr/19day 9hr	0
UNIT 2	59Rem/48.871Rem	16day 10hr/18day 9hr	3
UNIT 3			
UNIT 4			

SPECIALTY RESIN	X	**TYPE OF RESIN:** PRC-01M	**USED DURING: S/D CLEANUP**	X	**ONLINE**	X	

RCS FILTRATION MICRON SIZE: ON-LINE: .05 **DURING SHUTDOWN CLEANUP:** .45

Previous Year	LOWEST and HIGHEST CANISTER DOSE (Rem)	HIGHEST KW & BURNUP CASK	NUMBER OF CANISTERS	VENDOR	CANISTER TYPE
DRY FUEL STORAGE CAMPAIGN	76/44 mRem	23.95	6	Holtec	100

Additional Comments:

RP-ALARA Association

PLANT STATUS REPORT QUESTIONAIRE – Year_2022_

STATION: _Browns Ferry_____

UTILITY: __TVA__ _____

Prepared By: __Dave Johnson/Archie Anderson/Rick Schmehl/Frank Atkinson_ _____

	CYCLE #	Previous Year ON-LINE DOSE (Rem-DLR)	RWP person hours	ONLINE Level 2&3 PCE'S
UNIT 1	13	32.917	140,853	0
UNIT 2	21	69.140	189,805	0
UNIT 3	20	38.793	129,608	0
RW/Common	FY21	47.248	248,925	/3 added to each unit

	LAST REFUEL OUTAGE EXPOSURE ESTIMATE / ACTUAL (Rem-DLR)	DURATION ESTIMATE / ACTUAL	Level 2&3 PCE's
UNIT 1	97.776 / 72.434	<26:00 / 35:17	0
UNIT 2	122.258 / 164.159	42:21 / 55:1	1
UNIT 3	130.472 rev to 99.564 / 93.116	37:14 / 37:14	0
UNIT 4			

SPECIALTY RESIN		TYPE OF RESIN:	USED DURING: S/D CLEANUP		ONLINE	
RCS FILTRATION MICRON SIZE: ON-LINE:			DURING SHUTDOWN CLEANUP:			

Previous Year	LOWEST and HIGHEST CANISTER DOSE (Rem)	HIGHEST KW & BURNUP CASK	NUMBER OF CANISTERS	VENDOR	CANISTER TYPE
DRY FUEL STORAGE CAMPAIGN	0.400 Rem / 0.873 Rem	33 KW	12	Holtec	FW/VW

Additional Comments:

RP-ALARA Association

PLANT STATUS REPORT QUESTIONAIRE – Year_2022_

STATION: _Callaway_____ _____

UTILITY: __Ameren Missouri__ _____

Prepared By: __Aaron Enloe/Adam Gilliam_ _____

	CYCLE #	Previous Year ON-LINE DOSE (Rem-DLR)	RWP person hours	ONLINE Level 2&3 PCE'S
UNIT 1	25	3.32	92,313	1
UNIT 2				
UNIT 3				
RW/Common				

	LAST REFUEL OUTAGE EXPOSURE ESTIMATE / ACTUAL (Rem-DLR)	DURATION ESTIMATE / ACTUAL	Level 2&3 PCE's
UNIT 1	26.7/22.477	55/79.3	0
UNIT 2			
UNIT 3			
UNIT 4			

SPECIALTY RESIN		**TYPE OF RESIN:**	**USED DURING: S/D CLEANUP**		**ONLINE**	

RCS FILTRATION MICRON SIZE: ON-LINE: .1 DURING SHUTDOWN CLEANUP: 1

Previous Year	LOWEST and HIGHEST CANISTER DOSE (Rem)	HIGHEST KW & BURNUP CASK	NUMBER OF CANISTERS	VENDOR	CANISTER TYPE
DRY FUEL STORAGE CAMPAIGN	0.225 Rem / 0.450 Rem		12	Holtec	HiStorm

Additional Comments:

RP-ALARA Association

PLANT STATUS REPORT QUESTIONAIRE – Year_2022_

STATION: ____Davis-Besse_____

UTILITY: ____Energy Harbor_____

Prepared By: ___Cris Mingus_____

	CYCLE #	Previous Year ON-LINE DOSE (Rem-DLR)	RWP person hours	ONLINE Level 2&3 PCE'S
UNIT 1	22	8.467	137,252	0
UNIT 2				
UNIT 3				
UNIT 4				

	LAST REFUEL OUTAGE EXPOSURE ESTIMATE / ACTUAL (Rem-DLR)	DURATION ESTIMATE / ACTUAL	Level 2&3 PCE's
UNIT 1	52.121 / 40.129 (SRD)	30 days / 45 days	1 / 1
UNIT 2			
UNIT 3			
UNIT 4			

SPECIALTY RESIN	Y	**TYPE OF RESIN:** PRC-01	**USED DURING: S/D CLEANUP**	Y	**ONLINE**	

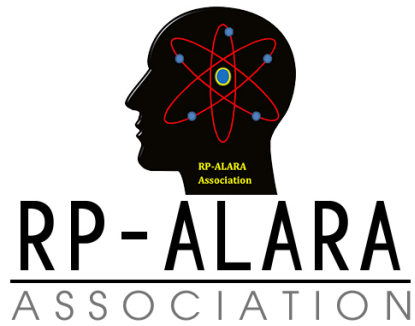
RCS FILTRATION MICRON SIZE: ON-LINE: Various **DURING SHUTDOWN CLEANUP:** 10 micron

Previous Year	LOWEST and HIGHEST CANISTER DOSE (Rem)	HIGHEST KW & BURNUP CASK	NUMBER OF CANISTERS	VENDOR	CANISTER TYPE
DRY FUEL STORAGE CAMPAIGN	0.406 Rem / 1.126 Rem	46.016 KW	8	Orano / TN	EOS37PTH

Additional Comments:

1R22 completed 4/15/22, dose listed is by SRD with DLR TBD. Dry cask done in 2019.

PWR RP/ALARA Association



PLANT STATUS REPORT QUESTIONAIRE – Year: 2022

STATION: Prairie Island
UTILITY: Xcel Energy
Prepared By: Dave Martin

	CYCLE #	Previous Year ON-LINE DOSE (Rem-DLR)	RWP person hours	ONLINE Level 2&3 PCE'S
UNIT 1	33	3.816	72068	0
UNIT 2	33	4.591	72068	0
UNIT 3				
UNIT 4				

	LAST REFUEL OUTAGE EXPOSURE ESTIMATE / ACTUAL (Rem-DLR)	DURATION ESTIMATE / ACTUAL	Level 2&3 PCE's
UNIT 1			
UNIT 2	31/37.919	27/28	0
UNIT 3			
UNIT 4			

SPECIALTY RESIN	X	**TYPE OF RESIN:** PRC-01	**USED DURING: S/D CLEANUP**	X	**ONLINE**

RCS FILTRATION MICRON SIZE: ON-LINE: 25 **DURING SHUTDOWN CLEANUP:** 25

Previous Year	LOWEST and HIGHEST CANISTER DOSE (Rem)	HIGHEST KW & BURNUP CASK	NUMBER OF CANISTERS	VENDOR	CANISTER TYPE
DRY FUEL STORAGE CAMPAIGN	.203/.344	30kw	3	Transnuclear	TN-HT40

Additional Comments:

RP-ALARA Association

PLANT STATUS REPORT QUESTIONAIRE – Year_2022_

STATION: __Seabrook Station

UTILITY: __NextEra Energy__

Prepared By: ___ _____

	CYCLE #	Previous Year ON-LINE DOSE (Rem-DLR)	RWP person hours	ONLINE Level 2&3 PCE'S
UNIT 1	21	1.546	65559	0
UNIT 2				
UNIT 3				
UNIT 4				

	LAST REFUEL OUTAGE EXPOSURE ESTIMATE / ACTUAL (Rem-DLR)	DURATION ESTIMATE / ACTUAL	Level 2&3 PCE's
UNIT 1	40.572/38	25/34	0
UNIT 2			
UNIT 3			
UNIT 4			

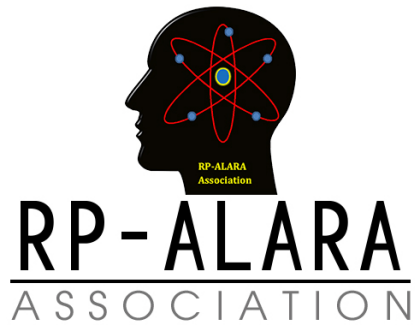
SPECIALTY RESIN		**TYPE OF RESIN:**	**USED DURING: S/D CLEANUP**		**ONLINE**	

RCS FILTRATION MICRON SIZE: ON-LINE: **DURING SHUTDOWN CLEANUP:**

Previous Year	LOWEST and HIGHEST CANISTER DOSE (Rem)	HIGHEST KW & BURNUP CASK	NUMBER OF CANISTERS	VENDOR	CANISTER TYPE
DRY FUEL STORAGE CAMPAIGN	N/A	N/A	N/A	N/A	N/A

Additional Comments:

PWR RP/ALARA Association



PLANT STATUS REPORT QUESTIONAIRE – Year: 2022

STATION: Prairie Island
UTILITY: Xcel Energy
Prepared By: Dave Martin

	CYCLE #	Previous Year ON-LINE DOSE (Rem-DLR)	RWP person hours	ONLINE Level 2&3 PCE'S
UNIT 1	33	3.816	72068	0
UNIT 2	33	4.591	72068	0
UNIT 3				
UNIT 4				

	LAST REFUEL OUTAGE EXPOSURE ESTIMATE / ACTUAL (Rem-DLR)	DURATION ESTIMATE / ACTUAL	Level 2&3 PCE's
UNIT 1			
UNIT 2	31/37.919	27/28	0
UNIT 3			
UNIT 4			

SPECIALTY RESIN	X	**TYPE OF RESIN:** PRC-01	**USED DURING: S/D CLEANUP**	X	**ONLINE**

RCS FILTRATION MICRON SIZE: ON-LINE: 25 **DURING SHUTDOWN CLEANUP:** 25

Previous Year	LOWEST and HIGHEST CANISTER DOSE (Rem)	HIGHEST KW & BURNUP CASK	NUMBER OF CANISTERS	VENDOR	CANISTER TYPE
DRY FUEL STORAGE CAMPAIGN	.203/.344	30kw	3	Transnuclear	TN-HT40

Additional Comments:

HIGH INTEREST TOPIC AND QUESTIONNAIRE

RP-ALARA Association Chattanooga, TN June 20-22, 2022

Topic:

Name: Contact Info:

Contact (Name)	Plant	NSSS	Comments
	ANO 2,1	CE, B&W	
	Beaver Valley 1,2	3LW	
	Braidwood 1,2	4LW	
	Browns Ferry	BWR	
	Brunswick	BWR	
	Byron 1,2	4LW	
	Callaway	4LW	
	Catawba 1,2	4LW	
	Clinton	BWR	
	Davis Besse	B&W	
	DC Cook 1,2	4LW	
	Diablo Canyon 1,2	4LW	
	Farley 1,2	3LW	
	Framatome		
	Harris	3LW	
	Indian Point 2,3	4LW	
	LaSalle	GE, BWR	
	McGuire 1,2	4LW	
	Millstone 3,2	4LW, CE	
	Nine Mile Pt	B&W, BWR	
	North Anna 1,2	3LW	

Return completed form to the Committee Secretary prior to the end of the meeting so that it may be included in the meeting report.

HIGH INTEREST TOPIC AND QUESTIONNAIRE

RP-ALARA Association Chattanooga, TN June 20-22, 2022

Topic:

Name: Contact Info:

Contact (Name)	Plant	NSSS	Comments
	Oconee 1,2,3	B&W	
	Palisades	CE	
	Palo Verde 1,2,3	CE	
	Peach Bottom	BWR	
	Point Beach 1,2	2LW	
	Prairie Island 1,2	2LW	
	Quad Cities	BWR	
	River Bend	BWR	
	Robinson	3LW	
	Salem 1,2	4LW	
	Seabrook	4LW	
	Sequoyah 1,2	4LW	
	South TX Project 1,2	4LW	
	St.Lucie 1,2	CE	
	Surry 1,2	3LW	
	Turkey Point 1,2	3LW	
	VC Summer	3LW	
	Vogtle 1,2	4LW	
	Waterford	CE	
	Watts Bar	4LW	
	Wolf Creek	4LW	
	Other		

Return completed form to the Committee Secretary prior to the end of the meeting so that it may be included in the meeting report.