Coordination of Low-Dose Radiation Research

Electric Power Research Institute

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NASEM Developing a Long-Term Strategy for Low-Dose Radiation Research in the United States
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Outline

- Who is EPRI
- EPRI RS Program in Brief
- Low Dose Research Focus Area
- Key Products
- Thoughts

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

Our History

Rooted in:

- **Collaboration**
- **Cumulative Expertise**
- **Credibility**

Born in a

Blackout

- EPRI was founded by and for the electricity industry in 1972 following **The Great Northeast Blackout i**n New York City in 1965
- Formally established in 1973 as the Electric Power Research Institute, EPRI manages a broad public-private collaborative research program working with the electric utility industry, the industry's customers, and society at large

Independent
Objective, scientifically based results address reliability, efficiency, affordability, health, safety, and the environment

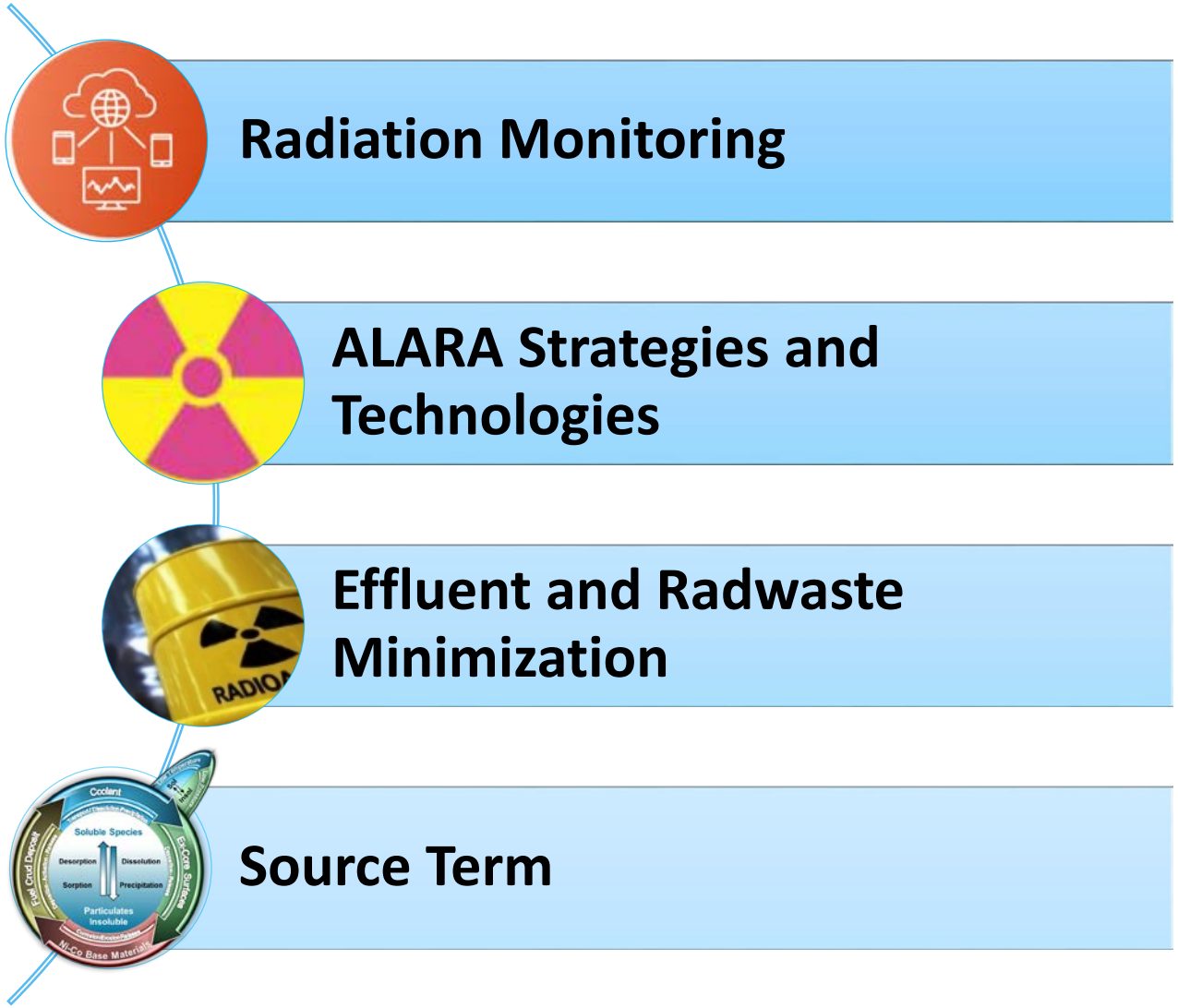
Nonprofit
Chartered to serve the public benefit

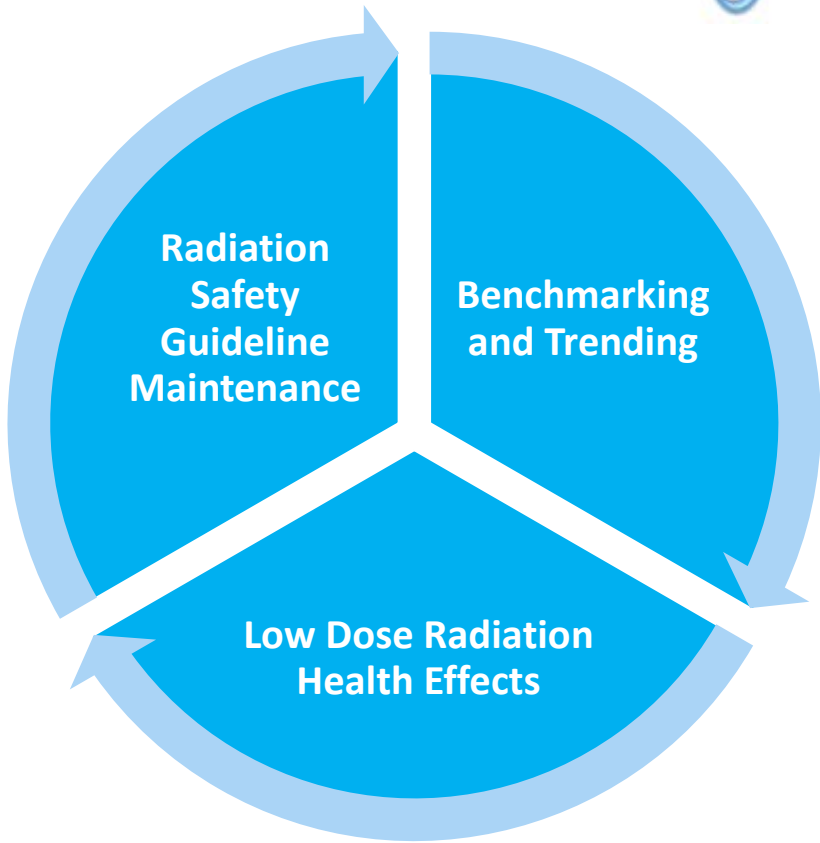
Collaborative
Bring together scientists, engineers, academic researchers, and industry experts

EPRI Nuclear Research Areas, Programs and Initiatives

Research Area	Programs
Materials Management	Steam Generator Management Program
	Materials Reliability Program
	BWR Vessel and Integrity Program
	Welding and Repair Technology Center
	Nondestructive Evaluation
Fuels and Chemistry	Fuel Reliability Program
	Nuclear Fuel Industry Initiative
	Water Chemistry
	Radiation Safety
	Used Fuel and High-Level Waste
Plant Performance	Nuclear Maintenance Application Center
	Plant Engineering
	Instrumentation and Control
	Risk and Safety Management
Strategic Initiatives	Advanced Nuclear Technology
	Plant Modernization Initiative
	Long-Term Operations
	Flexible Operations
	Decommissioning

Radiation Safety Research Focus Areas (2022)





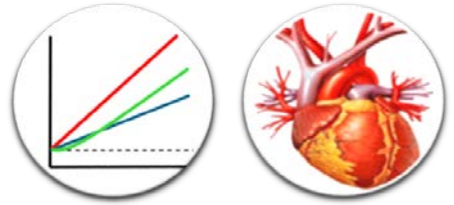
Radiation Safety Research Focus Area:

Low Dose Radiation Health Effects

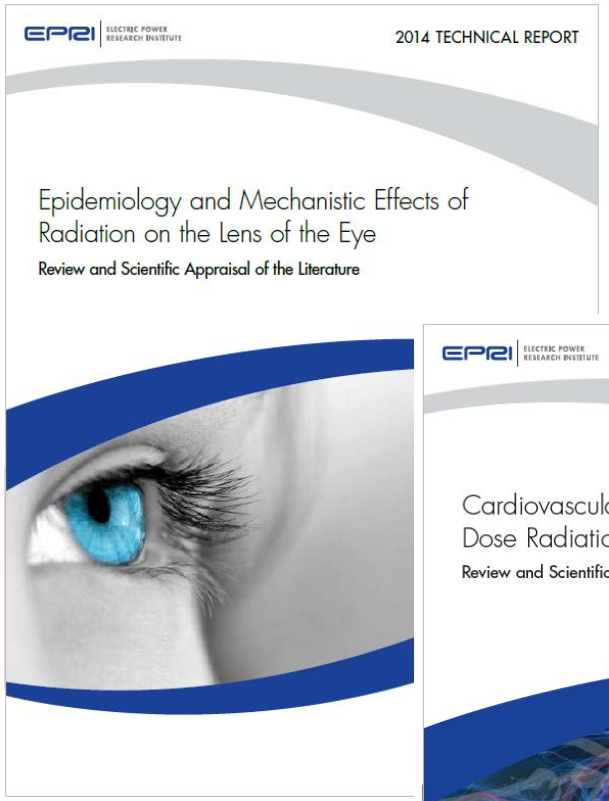
- **Low dose radiation health effects form the basis for radiation safety policies/standards and operational practices**
- **Purpose and Vision:**
  - Anticipate and Inform issues with sound technical information on Low Dose and Low Dose rate radiation effects
  - Create and Maintain globally valued and recognized expertise and contributions
  - Communicate research results and support member risk communication needs.
- **Objectives:**
  - Development of high-quality technical basis
  - Synthesis of research into an integrated picture
  - Creation of products to inform current issues
  - Leadership and support for dialogue and collaboration amongst global research organizations and platforms

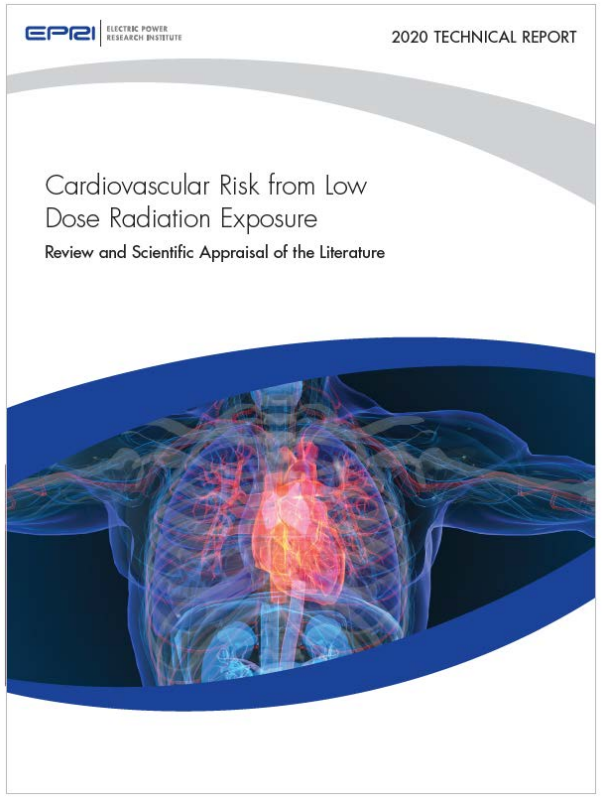
Project types	Typical deliverables	Specific near-term activities
• **Investigation of low dose cancer risks**	• EPRI Technical Reports • Peer reviewed journal articles • EPRI Commentaries	• Complete Cancer Risk Modeling
• **Investigation of non-cancer effects**	• EPRI Technical Reports • Peer reviewed journal articles	• Monitor for issues
• **Communication**	• EPRI Technical Reports • EPRI Issue Summaries	• Technical transfer of EPRI and external research and issues
• **Facilitate international collaboration**	• Workshops/Meetings/Proceedings	• International Dose Effect Alliance (IDEA)

Selected Key Products



- 1024677 Technical Considerations for the Nuclear Regulatory Commission/ National Academy of Sciences Proposed Study: Cancer in Populations Living Near Nuclear Facilities
- 3002003162 Epidemiology and Mechanistic Effects of Radiation on the Lens of the Eye: Review and Scientific Appraisal of the Literature
- 3002018408 Cardiovascular Risks from Low Dose Radiation Exposure: Review and Scientific Appraisal of the Literature

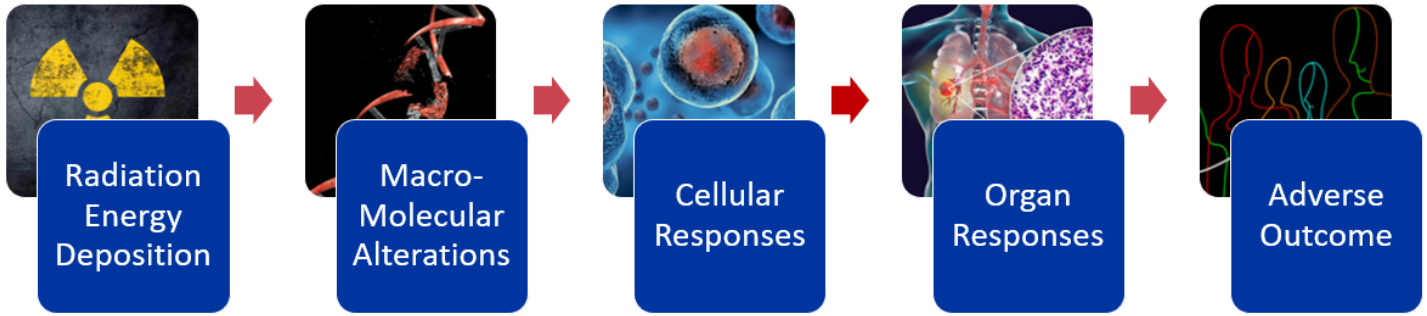




Low Dose Radiation Health Effects

Cancer Modeling: Activities

- **Adverse Outcome Pathway (AOP) Framework**
  - Exploration of general framework within which to start organizing information
  - Step towards possible “big data” and AI learning to organize research results
- **Cellular Microenvironment**
  - Literature Examination for information on intra and extra cellular microenvironment markers that may inform AOP key event
- **NEA HLG-LDR**
  - Participation in AOP topical Working Group and Subgroups
  - Host workshops and meetings



Low Dose Radiation Health Effects

International Dose Effect Alliance

International platform for information exchange, discussion, cooperation, and collaboration in low dose radiation research

Mission

- Facilitate **information exchange and collaboration** on low dose radiation research programs.
- Identify issues, areas of **synergy, and opportunities** for additional research.
- Foster **integrated, outcome-oriented approaches** to resolve low dose risk.

Goals

- **Develop connections** between programs conducting low dose radiation research.
- Facilitate discussions across countries and regions.
- Organize **collaborative forums** for exchange of research priorities, strategies, programs, and results.

Workshops

- 2016 Workshop 8-9 Nov 2016
  - 3002009919
- 2017 Workshop 12-14 Dec 2017
  - 3002012489
- 2018 Workshop 4-5 Dec 2018
  - 3002015176
- 2019 Workshop 3-4 Dec 2019
  - 3002017801
- 2020 Workshop 1-2 Dec 2020 Virtual
  - 3002020966 (in publication)
- 2021 Workshop 30 Nov - 1 Dec 2021

https://cvent.me/0KoX4R

Leverage global resources to enhance, accelerate, and target research results

Thoughts

- Research efforts need to have the objective in mind: reducing uncertainties and helping to define risks at occupational and public dose and dose rates
- Epidemiology and radiation biology must be brought together to create a more complete understanding
- Capture and organization of previous research to identify gaps and needs would be useful to inform calls for future work
- Communication of results to regulatory, industry, and public stakeholders is critical to inform understanding and make decisions about controlling radiation exposure
- Research is needed on how to apply risk information to regulatory structures and operational settings in an effective and unbiased manner
- EPRI would welcome the opportunity to collaborate in a new government low dose research program