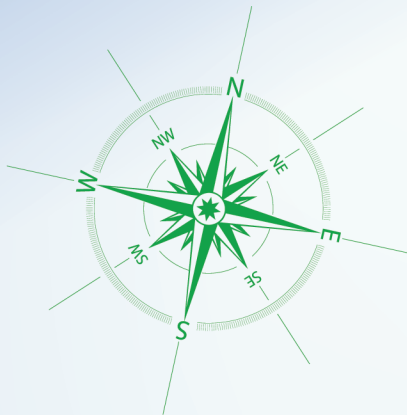


R^{HYBRID}**C 2023** U.S. Nuclear Regulatory Commission
35th Annual Regulatory Information Conference



NAVIGATING ^{the} NUCLEAR FUTURE

MARCH 14-16, 2023

Bethesda North Marriott Hotel
and Conference Center
Rockville, Maryland



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#NRCRIC2023



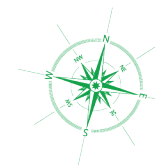
Setting a Course for the Future of Emergency Preparedness

Todd Smith, PhD

Senior Level Advisor for Emergency Preparedness and Incident Response

Office of Nuclear Security and Incident Response

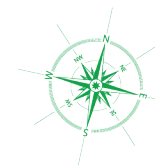
U.S. Nuclear Regulatory Commission

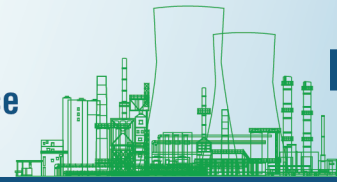




Radiological emergency preparedness (EP)—

- *ensures protective actions can and will be taken*
- *is an independent layer of defense in depth*
- *provides dose savings*
- *is risk-informed*

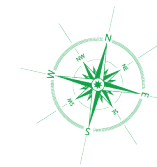


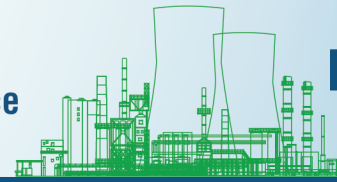


The journey starts with a proven basis

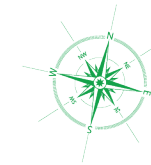
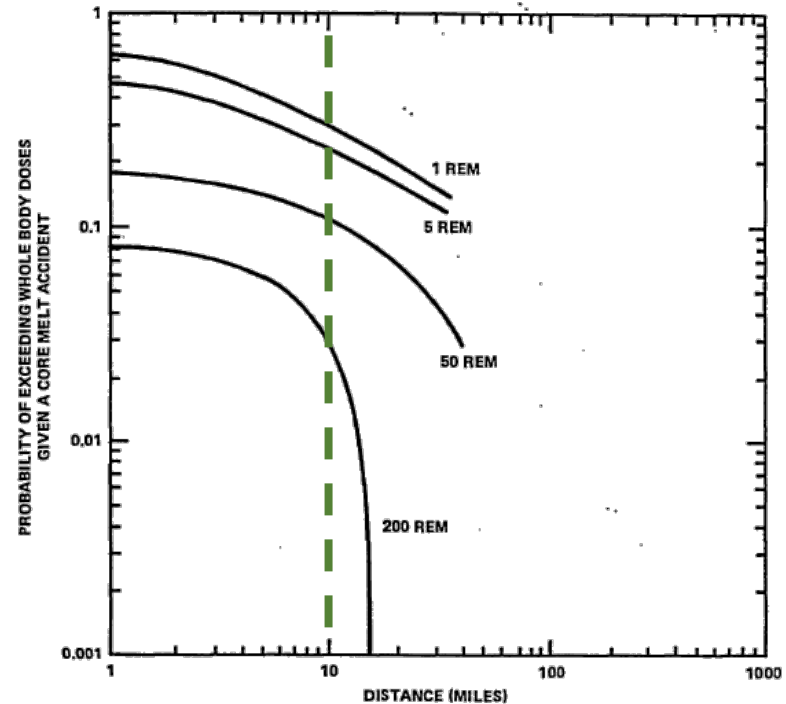
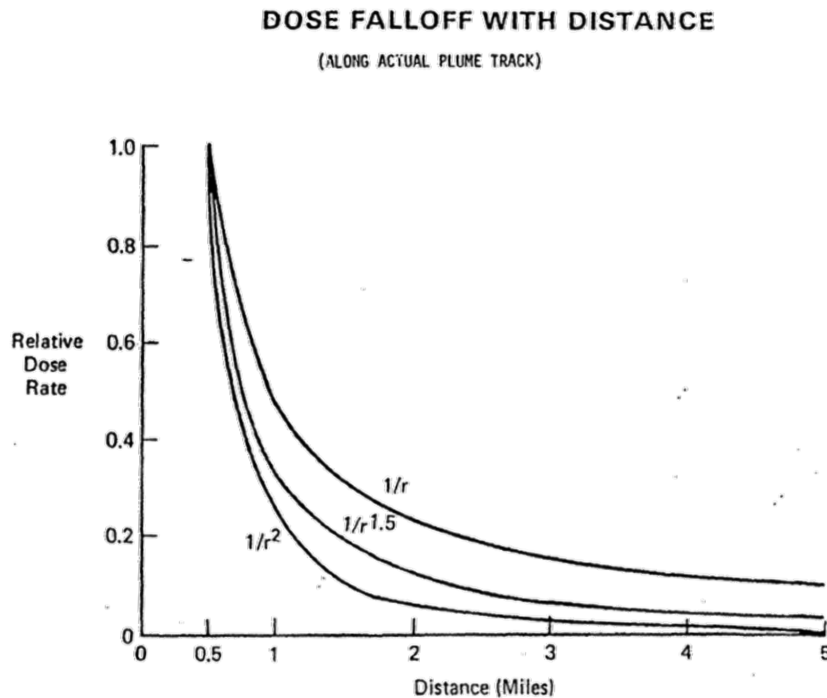
The consequences from a spectrum of accidents, tempered by probability considerations, should be considered to scope the planning efforts for—

- *the **distance** to which planning for predetermined protective actions is warranted [the emergency planning zone (EPZ)]*
- *the **time**-dependent characteristics of a potential release*
- *the type of radioactive **materials***



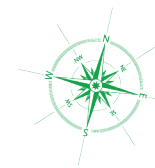


The EPZ has a specific purpose in planning





EP and the Cliff Edge





EP is a Whole Community approach



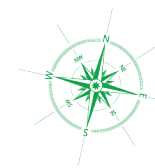
Licensee



State/Local



Federal



National Preparedness

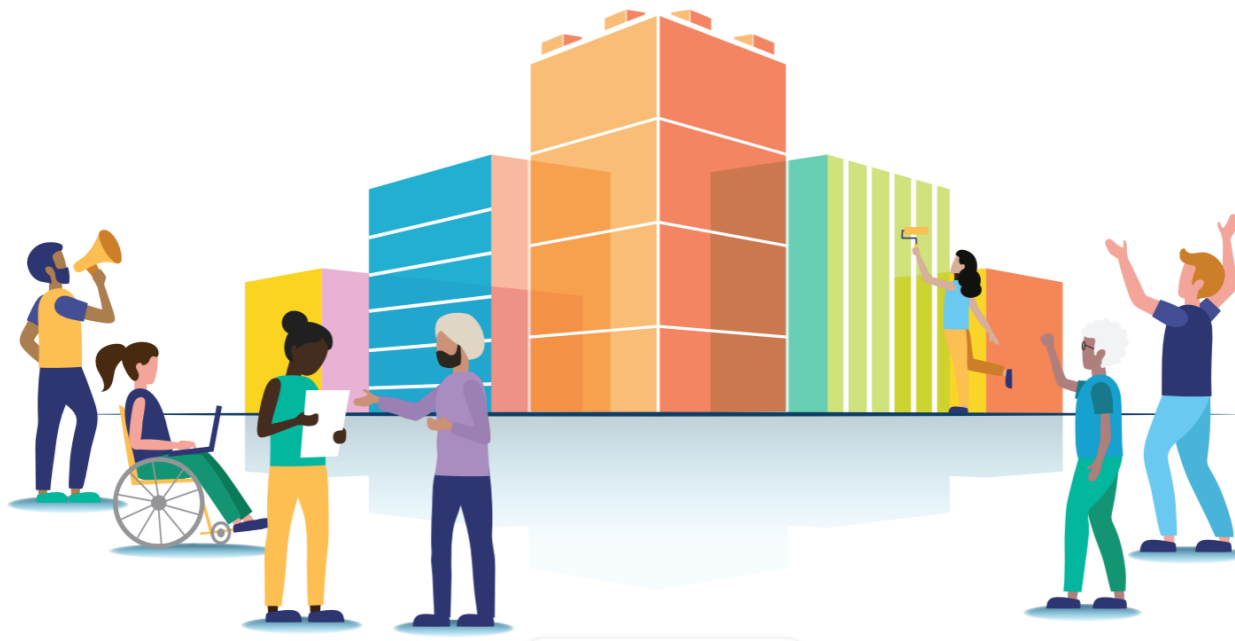
Regulatory Information Conference | 14 March 2023



FEMA

FEMA

Preparedness is Whole Community



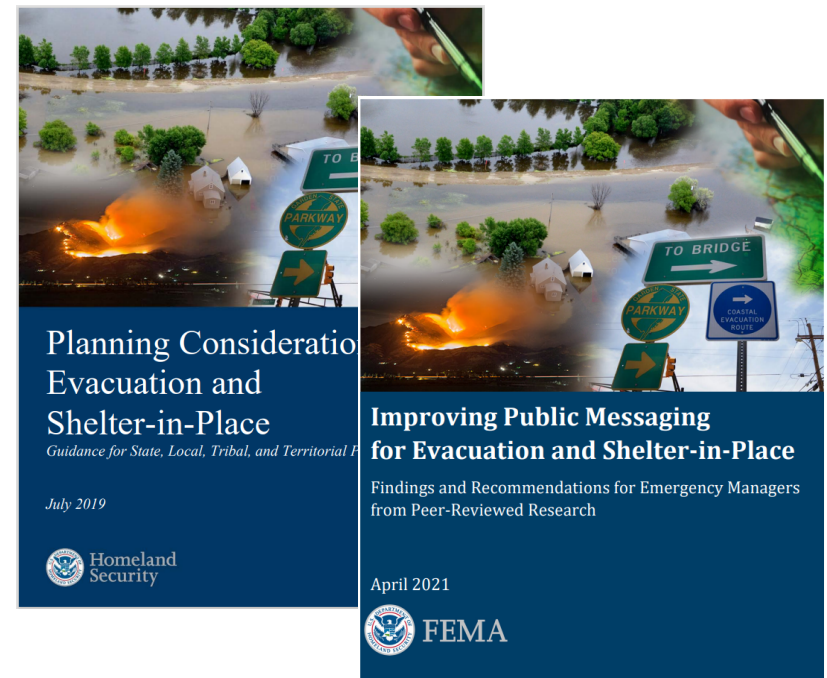
FEMA

Preparedness is Whole Community



FEMA

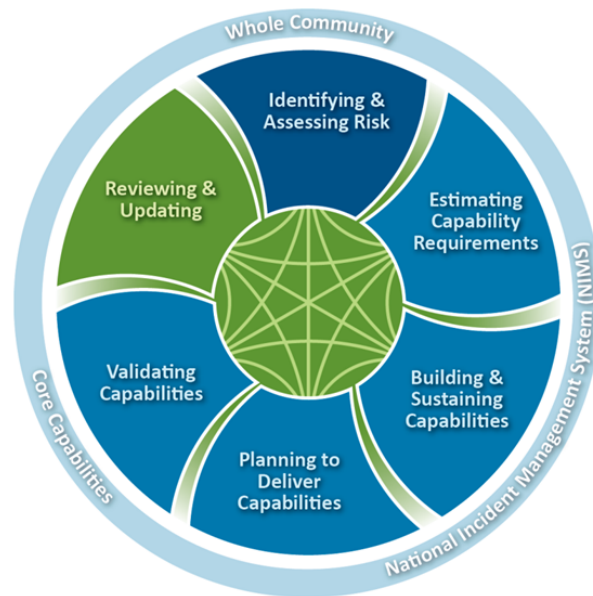
Preparing for Disasters



FEMA

National Preparedness System

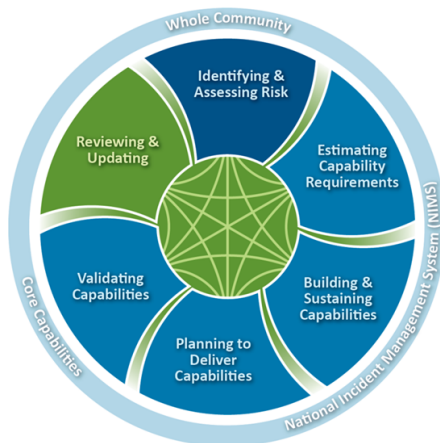
An integrated set of guidance, programs, and processes that enables the Whole Community to meet the Goal.



FEMA

National Preparedness System

An integrated set of guidance, programs, and processes that enables the Whole Community to meet the Goal.



A **secure and resilient nation** with the **capabilities** required across the **whole community** to **prevent, protect** against, **mitigate, respond** to, and **recover** from the **threats and hazards** that pose the **greatest risk**.



FEMA

Preparedness



FEMA

Preparedness



Build A Kit

Have enough food, water and other supplies to support your needs for several days.



- ✓ Charge Devices
- ✓ Lock Door
- ✓ Stay Tuned

Ready ✓

Have An Evacuation Plan



Ready ✓



FEMA

Contact Information

CAPT Janis McCarroll, P.E., USPHS
Senior Public Health Advisor
Office of National Exercises and Technological Hazards
Resilience | National Preparedness
DHS | Federal Emergency Management Agency
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FEMA

Federal Radiological Monitoring and Assessment Center (FRMAC)

This work was done by Mission Support and Test Services, LLC, under Contract No. DE-NA0003624 with the U.S. Department of Energy. DOE/NV/03624--0615.



FRMAC Mission



Provide additional technical expertise and assistance to support local responders in the event of a radiological release or accident.

- Technical Expertise
 - Health Physics
 - Atmospheric Modeling
 - Aerial Measurements
 - Environmental Monitoring & Sampling
- Technical Assistance
 - Data Visualization
 - Sample Control & Management

Mission Statement

Provide timely, high-quality predictions, measurements, analyses, and assessments to promote efficient and effective emergency response for the protection of the public from the consequences of nuclear or radiological incidents.



History

- March 28, 1979: Three Mile Island highlighted inadequacies in preparedness for a large-scale radiological/nuclear release
 - Inadequate evacuation plans for the nearby cities
 - Significant confusion about protective actions
 - Lack of coordination among Federal agencies and between levels of government



- An Executive Order was issued mandating federal preparations for radiological emergencies
- November 1985: FRERP published and Federal interagency body created - FRMAC



Responses and Training

Real World Participation

- National/International Scale Events
 - Chernobyl, Fukushima Daiichi
- Regional/Small Scale Events
 - Average of 3-5 responses per year



Exercise Participation

- Large Scale Exercises (Full FRMAC, 100 + participants)
 - About 1 large scale drill every 18 months
 - Recent Drills include:
 - Cobalt Magnet 2022, Cobalt Magnet 2019, Northern Lights 2016, Southern Exposure 2015, Vibrant Response, Diablo Bravo, NUWAIIX, Empire 09
- Small Scale Exercises/Drills (CMAC level) at least annually
- Home Team Support Drills/Exercises: 6 – 10 per year



FRMAC Support Includes...

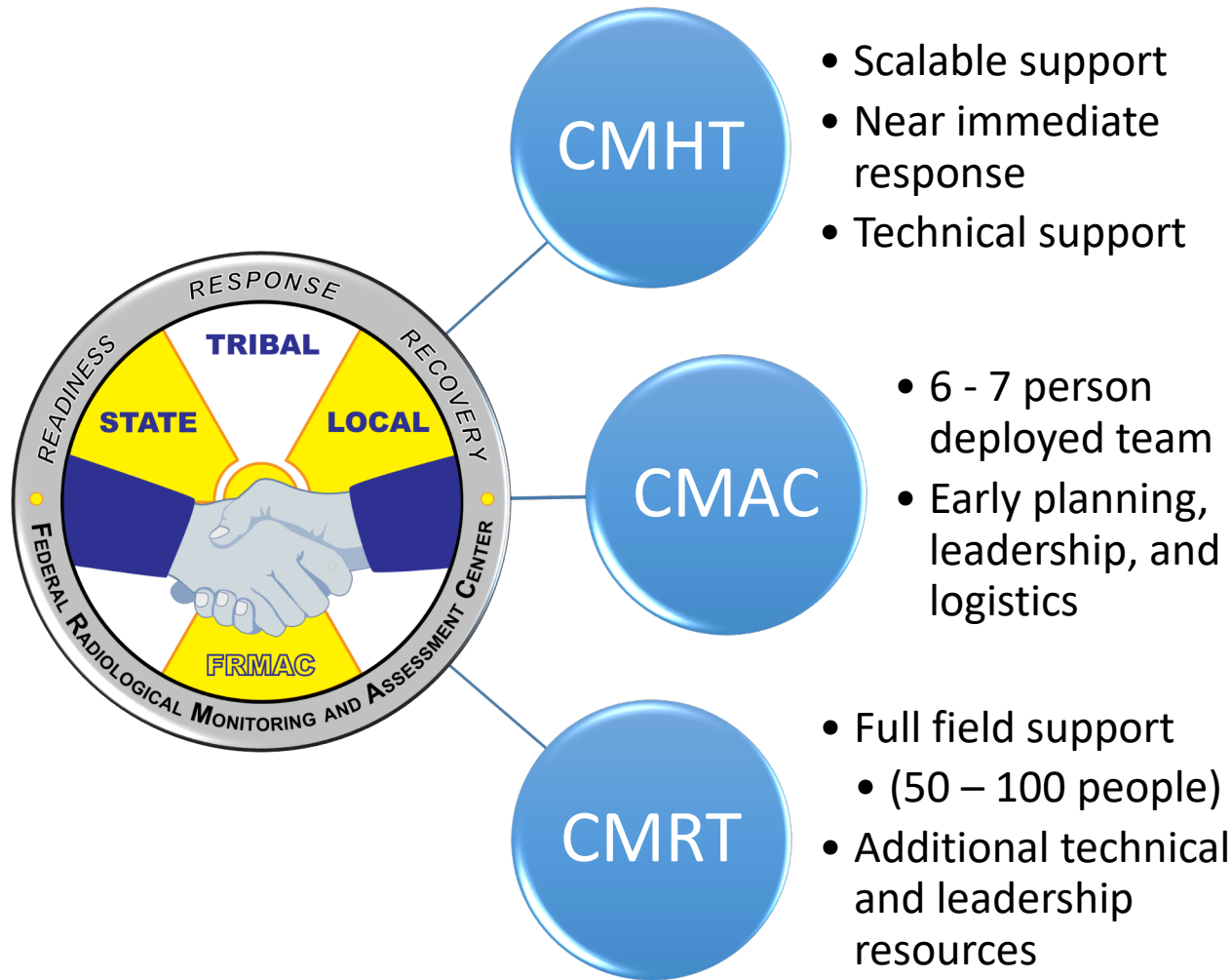
- Coordination of
 - Radiological monitoring and assessment activities
 - Laboratory analysis capabilities and activities (fixed off-site labs & on-site mobile labs)
 - Support for medical service providers
 - Interactions with Advisory Team for Environment, Food, and Health
- Liaison with state, tribal and local agencies
- Management of all off-site radiological monitoring data
- Development of visualization products and assessment reports to support protective action decisions, evaluation of potential impacts of radiological contamination, and maintaining situational awareness
- Additional resources to augment local radiological monitoring and assessment activities



FRMAC Response: Assets and Timeline



FRMAC Initial Response Elements



Consequence Management Home Team (CMHT)

- Scientific Support
 - Atmospheric Modeling
 - Assessment Scientists
 - Health & Safety
 - Aerial Measurements
 - Laboratory Methods
- Advisory Team (Remote A-Team)
- Communications Support
 - Bridge Lines & Coordinators
 - Data Management
- Product Support
 - GIS Specialists
 - Product development and interpretation
- Logistics Support
 - Personnel
 - Field Samples & Off-Site Laboratory support



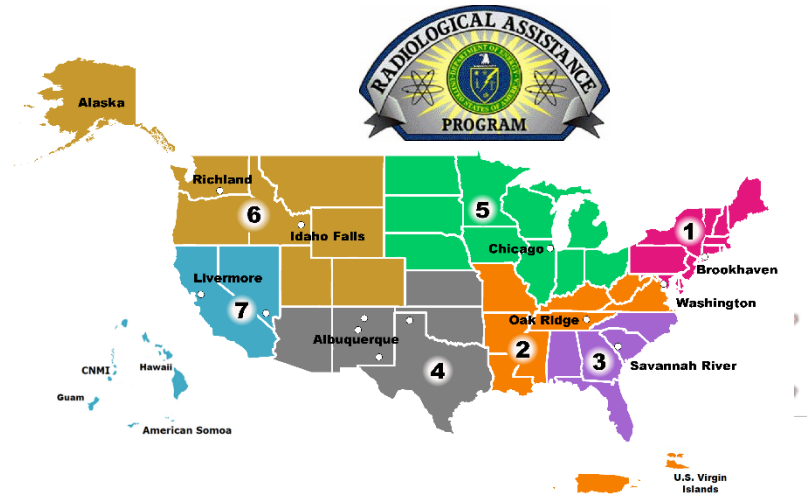
National Atmospheric Release Advisory Center (NARAC)

- Transport and diffusion models simulate the release and predict the extent of the hazard.
- 3-D modeling system with continuous representation of terrain.
- Combines the model with data collected from the field and real-time meteorological conditions.



Radiological Assistance Program (RAP)

- Locate and identify radiological materials
- Evaluate data and provide risk assessments
- Provide advice and inform decisions to protect people and property
- Translate complex technical data into information that the public can easily understand
- Available 24/7/365 for technical support and advice



CM Response Team (CMRT)

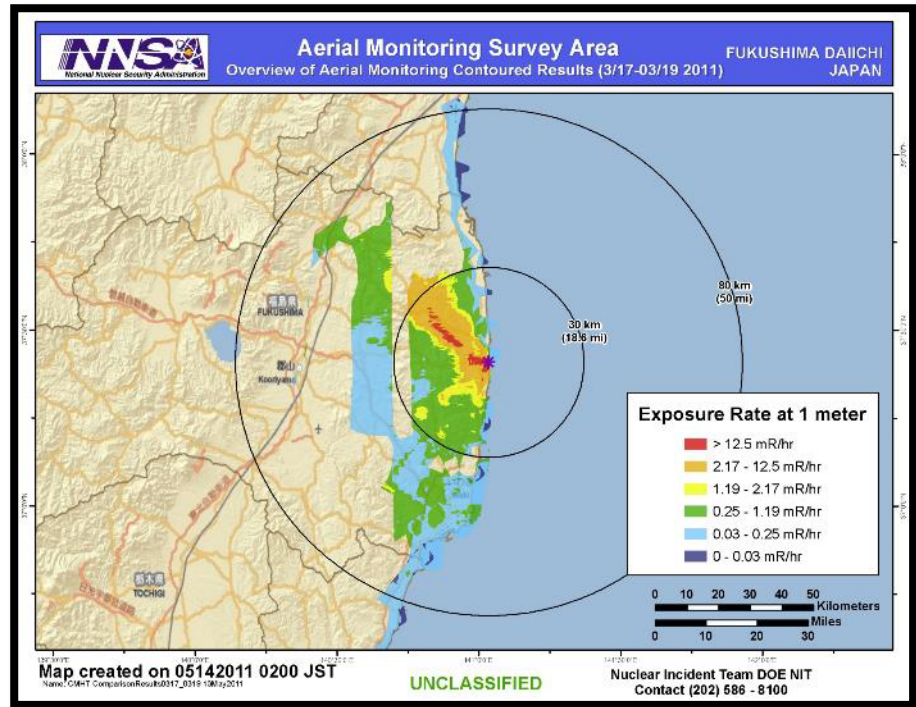


- Assessment scientists to support data evaluation and visualization and support public & responder safety calculations
- Geographical Information Systems (GIS) equipment and personnel for creating map products to visualize data and potential extents
- Health & Safety specialists to support responders
- Field teams to assist with data and sample collection
- Contamination control and Health & Safety personnel to support field team activities
- Sample control personnel to catalog and manage sample collection and analysis
- Laboratory analysis personnel and equipment to support field deployable instrumentation (Fly-Away Laboratory)
- Logistics support for FRMAC teams



Aerial Measuring Systems (AMS)

- Fixed-wing Aircraft
 - Rapid response aircraft
 - Large Area surveys
- Helicopters
 - Detailed area surveys
- Data collected can be used to
 - Rapidly develop maps of potential radiation exposure to personnel in affected areas
 - Develop maps of the radiological materials deposited on the ground
 - Provide information to NARAC to improve the models for the release



Radiation Emergency Assistance Center/Training Site (REAC/TS)

- Emergency response, advice and consultation in cases of human radiation exposure, in person or remotely.
- Education and facilitating a network of professionals specializing in radiation medicine.
- Assisting in the development of medical emergency plans to address large-scale radiation incidents.
- Providing the “gold standard” of biodosimetric dose assessment.



If you have any questions, please contact:

Alvin Morris

FRMAC Program Manager

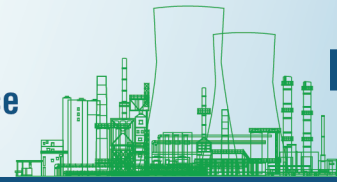
Alvin.Morris@nnsa.doe.gov

702-794-1062

Additional information on FRMAC operations, methods, and procedures can also be found in the FRMAC manuals

https://www.nnss.gov/pages/programs/FRMAC/FRMAC_DocumentsManuals.html

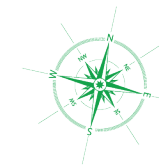


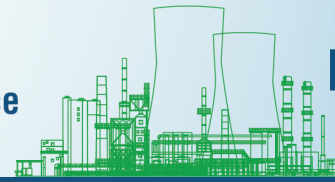


NRC is charting a new course in EP regulation

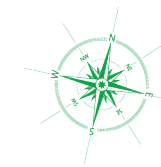
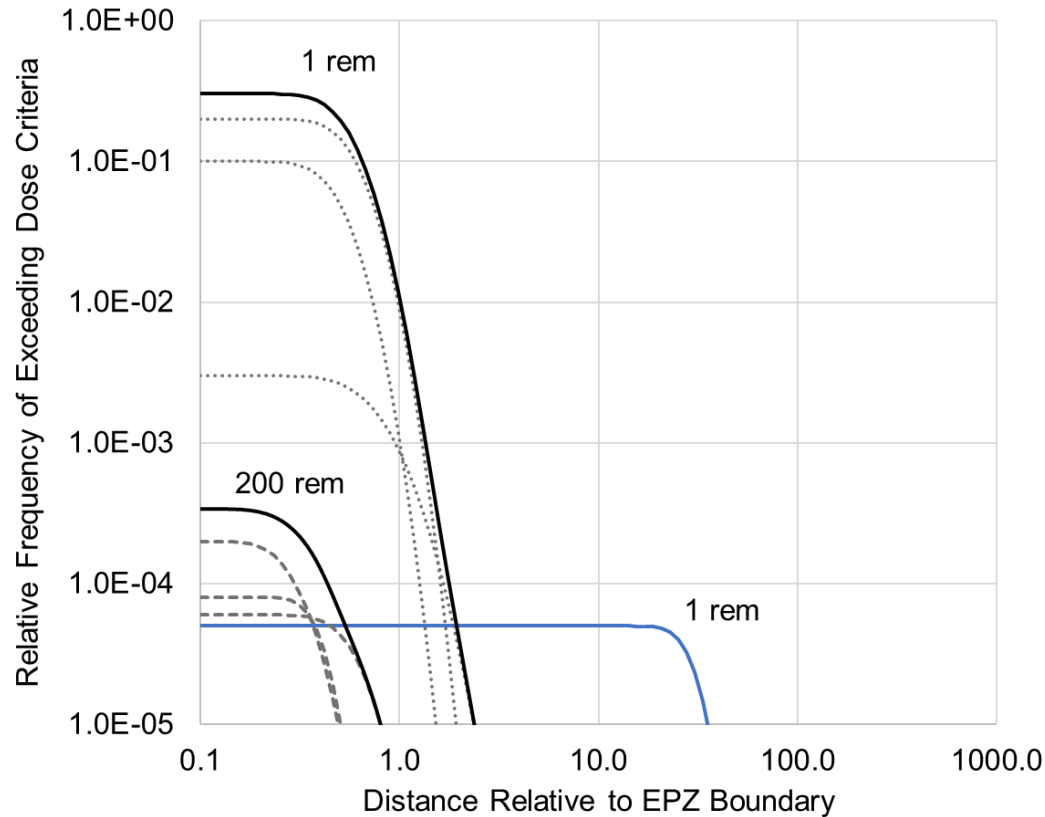
Draft final 10 CFR 50.160 provides an alternative framework for small modular reactors and other new technologies:

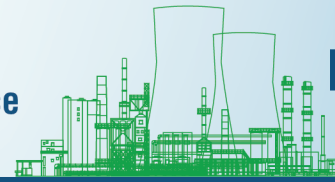
- regulatory framework proportional to facility risk
- technology inclusive, performance based
- hazard analysis for contiguous facilities
- ingestion planning capabilities rather than defined ingestion planning zone
- scalable EPZ size informed by dose at distance calculations



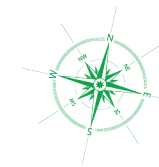


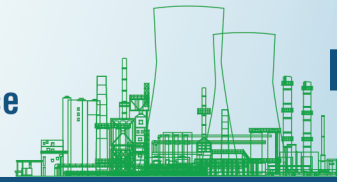
EP is risk-informed, not risk-based



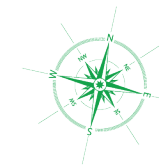


EP is the answer to uncertainty



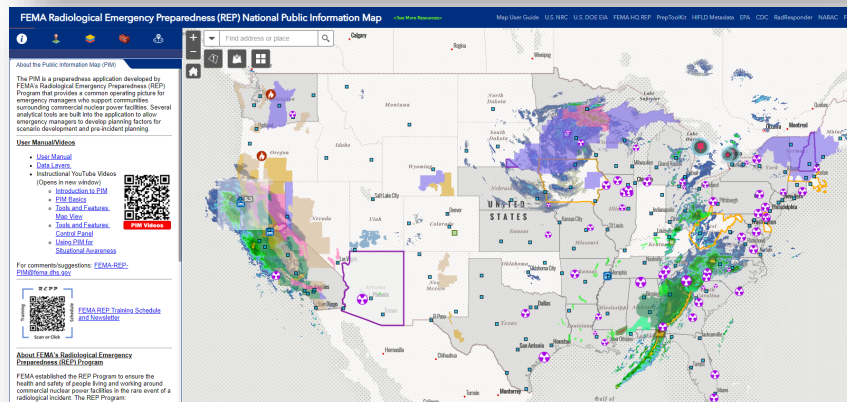


EP provides a safe harbor



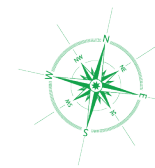


NAVIGATING the NUCLEAR FUTURE





***NRC emergency preparedness regulations
provide a safe passage to our nuclear future***





References:

U.S. NUCLEAR REGULATORY COMMISSION, Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plants, NUREG-0396/EPA 520/1-78-016, Washington, DC (1978).

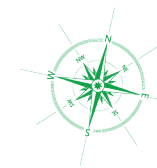
U.S. NUCLEAR REGULATORY COMMISSION, Use of Probabilistic Risk Assessment Methods in Nuclear Regulatory Activities; Final Policy Statement, 60 FR 42622 (1995).

U.S. NUCLEAR REGULATORY COMMISSION, Acceptability of Probabilistic Risk Assessment Results for Non-Light-Water Reactor Risk-Informed Activities, Regulatory Guide 1.247 (for Trial Use), Washington, DC (2022).

U.S. NUCLEAR REGULATORY COMMISSION, Guidance on the Treatment of Uncertainties Associated with PRAs in Risk-Informed Decisionmaking, Final Report, NUREG-1855, Rev. 1, Washington, DC (2017).

U.S. NUCLEAR REGULATORY COMMISSION, Final Rule: Emergency Preparedness for Small Modular Reactors and Other New Technologies, SECY-22-0001, Washington, DC (2022).

<https://www.ready.gov/radiation>





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