NUCLEAR ENERGY ADVISORY COUNCIL
September 13, 2023 7:00 PM
Waterford Town Hall

MINUTES

Members Present
Rep Kevin Ryan, Chair
Alternate Chair Mr. Jeffrey Semancik representing DEEP Commissioner Dykes
Mr. James Sherrard
Mr. R. Woolrich
Mr. John McGunnigle
Mr. Craig Salonia
Sen Cathy Osten

Members not present:
Mr. A. Jordan
Mr. Bill Sheehan

1. **Call to Order of Meeting**
   The Council's Chair called the meeting to order at 7:00 PM.

2. **Special Presentation on Emergency Planning for Advanced Reactors** – Todd Smith, PhD, Senior Level Advisor for Emergency Preparedness and Incident Response in the Office of Nuclear Security and Incident Response (US Nuclear Regulatory Commission (NRC)) and CAPT Janis McCarroll, P.E., USPHS, Senior Policy Advisor for the Technological Hazards Division (FEMA) provided the Council with a briefing on Emergency Planning requirements for advanced reactors. These senior staff from the NRC and FEMA provided a brief overview of the changing landscape of nuclear power and actions being taken at the federal level to ensure the safe use of advanced nuclear technologies and adequate radiological emergency preparedness for the whole community.
   a. NRC and FEMA work together with state, local, tribal, and territorial governments to ensure that adequate capabilities are in place for responding to radiological emergencies at nuclear power plants. The radiological emergency preparedness programs around commercial nuclear power plants, like Millstone, have served the nation well for decades and provide a framework to build upon for community preparedness. The future of nuclear power in our nation is going to look different from the large light water reactor technologies of the past. Advanced safety technologies are being incorporated into the designs for small modular reactors, microreactors, and other new technologies that will be deployed to help meet our need for clean energy and nuclear medicine.
   b. NRC emergency planning (EP) requirements are risk informed vice risk based. Risk based would be quantitative. Using a risk informed approach, EP provides

an additional level of defense-in-depth to ensure health and safety of public in even if other safety systems and protocols fail.

c. In addition, analysis of the response to Fukushima demonstrated that unwarranted public protective actions can result in more harm than good. As a result, the EP requirements for advanced reactors provide a method for vendors to use risk-informed, consequence-oriented approach. The rule is written to be technology inclusive and less prescriptive focusing on "what' needs to be done vice "how" to do it. The rules are also performance based and focus on demonstrated performance of capabilities. Licensees will use performance metrics to identify areas that need improvement so they can focus their resources in these areas and achieve sustained performance.
d. Dr. Smith noted that the Emergency Planning Zone (EPZ) should not be confused with EP. The EPZ is an area where pre-determined, prompt protective actions can be taken. EP represents all of the capabilities required in the event of an emergency. A large EPZ is required for existing large Light Water Reactors (LWRs) because initial studies showed action may be required in as little as 30 minutes. An EPZ has tow criteria, - a form identifying at what level action is required and a function specifying what prompt actions (such as evacuation) should be taken. The EPZ bounds an area, not the capabilities. NRC has licensed other reactors with less than a 10-mile EPZ such as Humboldt Bay which has a 5-mile EPZ. If the zone where prompt protective actions might be required goes beyond the site boundary, the FEMA is involved since there are more requirements involving offsite response organizations (OROs). The new EP rules still require coordination with OROs and training of responders as part of whole community approach.
e. CAPT McCarroll noted that FEMA is capabilities focused within the all hazards framework.

3. **Questions from the Council**
    a. Mr. Sherard asked to define advanced nuclear and whether it included fusion. Dr. Smith stated small modular reactors are defined as less than 1000 MWe. He also stated that the NRC commissioners recently approved a rule to regulate fusion energy under material licensing rules vice as utilization facilities.
    b. Mr. Semancik asked to define the relationship between NRC and FEMA with respect to EP. Dr. Smith NRC has authority over licensees and FEMA provides assistance through a Memorandum of Understanding (MOU) for oversight and evaluation of state and local OROs. The NRC must make a determination of reasonable assurance in EP including determination that adequate protective measures can and will be taken. The NRC relies on FEMA's input as part of their determination. He also noted that the recent rulemaking does not change the relationships of NRC, FEMA and OROs. CAPT McCarroll added that FEMA does not regulate the OROs but rather supports state and local OROs as well as industry partners.

c. Mr. McGunnigle asked what will it look like to build preparedness standards across all hazards for communities that do not have an existing EP for LWRs. Dr. Smith answered that these communities will be able to build off of what we've learned to fundamentally determine what they need to be safe. CAPT McCarroll noted that every three years by law states must evaluate the threats and hazards in their area to determine how they will allocate their EP funding. She noted that advanced reactors, rather than having a dedicated funding source like large LWRs, will likely have to be evaluated within this framework.
d. Mr. Semancik asked if advanced reactors might require "reverse EP" where they rely on ORO's to provide capabilities that licensees of existing reactors provide themselves (for example, microreactors with minimal or no operators). Dr. Smith state in those instances licensees will have to have MOUs with OROs and provide necessary training and familiarity with site and required actions.
e. Mr. Woolrich asked if the NRC expects and SMRs to come online soon and if each vendor type as a standard EP package. Dr. Smith noted that the Carbon Free Power Project at Idaho National Laboratories is supposed to come on line by 2030 with SMRs. He also noted projects in Wyoming (Terrapower) and with the Air Force in Alaska (Project Pele) are working. He said each vendor has a standard design and produces a topical report discussing the EP.
f. Mr. McGunnigle asked if NRC had authority to regulate advanced reactors on tribal lands and if this would be a way for vendors to work around NRC regulations. Dr. Smith stated NRC did not have authority to regulate tribal nations. He will follow up on what the regulatory path would be for a proposed reactor on tribal lands.
g. Mr. Woolrich asked if FEMA is involved in exercises. FEMA stated they evaluate OROs for LWR exercises but also participate in these exercises at the state emergency operations center as well as some national level exercises, the next full national exercise will be Cobalt Magnet in Michigan in 2025.

4. **Public Comment.**
   a. There were 5 members of the public present.
   b. There were no comments from the public.

5. **Adjournment**
   Meeting adjourned at 8:41 PM.

Emergency Preparedness for Advanced Reactors

CAPT Janis McCarroll, P.E., USPHS
Senior Public Health Advisor

Todd Smith, PhD
Senior Level Advisor for Emergency Preparedness

FEMA

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

NRC

Who We Are, What We Do, and How it Affects You

National Policies Impact All of Us

AN ACT

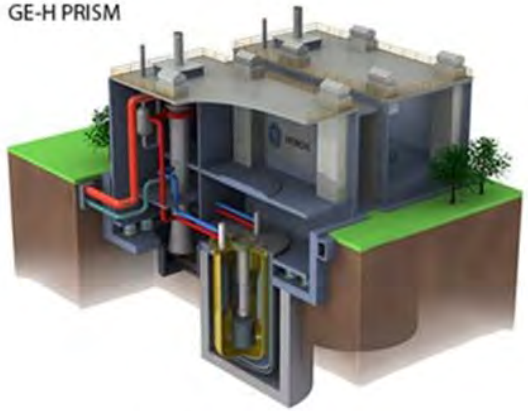
To enable civilian research and development of ad
energy technologies by private and public institutions
theoretical and practical knowledge of nuclear physics, ch
and materials science, and for other purposes.

Section 1. Short title

This Act may be cited as the "Nuclear Energy Innovation Capabilities Act of 2017".

Advanced Reactor Preparedness Starts Now

GE-H PRISM



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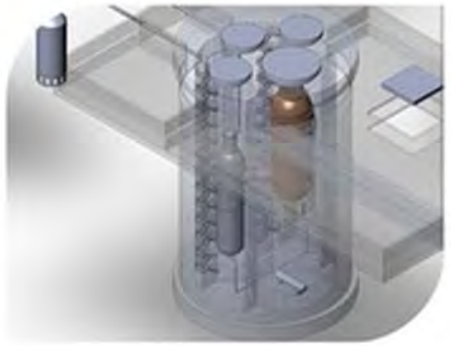
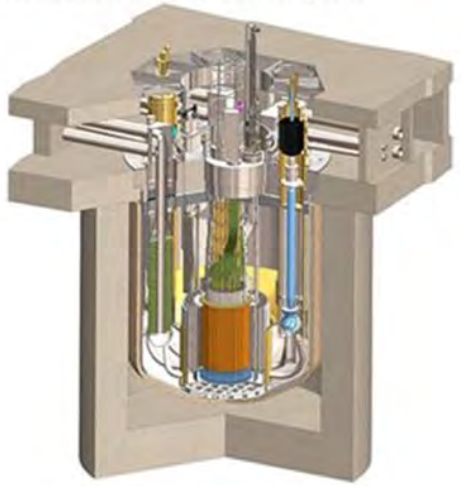


Terrestrial Energy's Integral Molten Salt Reactor (IMSR)

X-energy

TerraPower Traveling Wave Reactor (TWR)



NRC Employs a Graded Approach to Emergency Preparedness

Preparedness starts with a proven planning basis

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

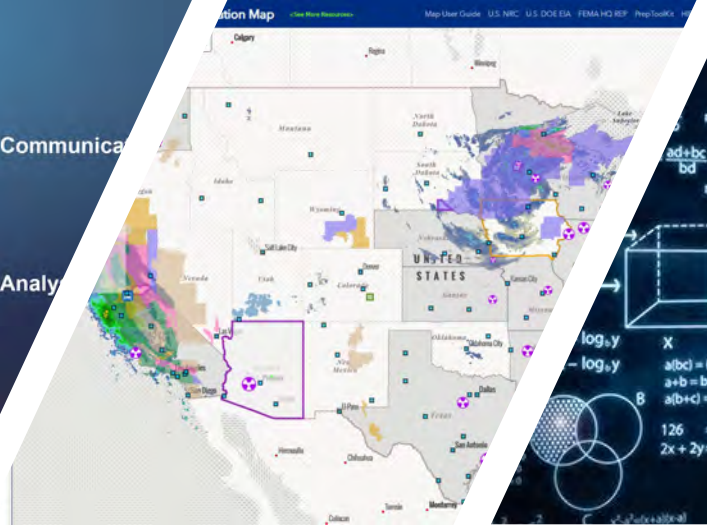
- *the **distance** to which planning for predetermined protective actions is warranted [the emergency planning zone (EPZ)]*
- *the **time**-dependent characteristics of a potential release*
- *the type of radioactive **materials***

Small Modular and Advanced Reactors will maintain an EP program

The NRC's alternative framework for small modular reactors and other new technologies:

- sets capabilities proportional to facility hazards
- technology inclusive, performance based
- hazard analysis for contiguous facilities
- requires demonstration of sustained performance
- scalable EPZ informed by analyses

Coordination Between Licensee and Offsite Response Organizations is Vital



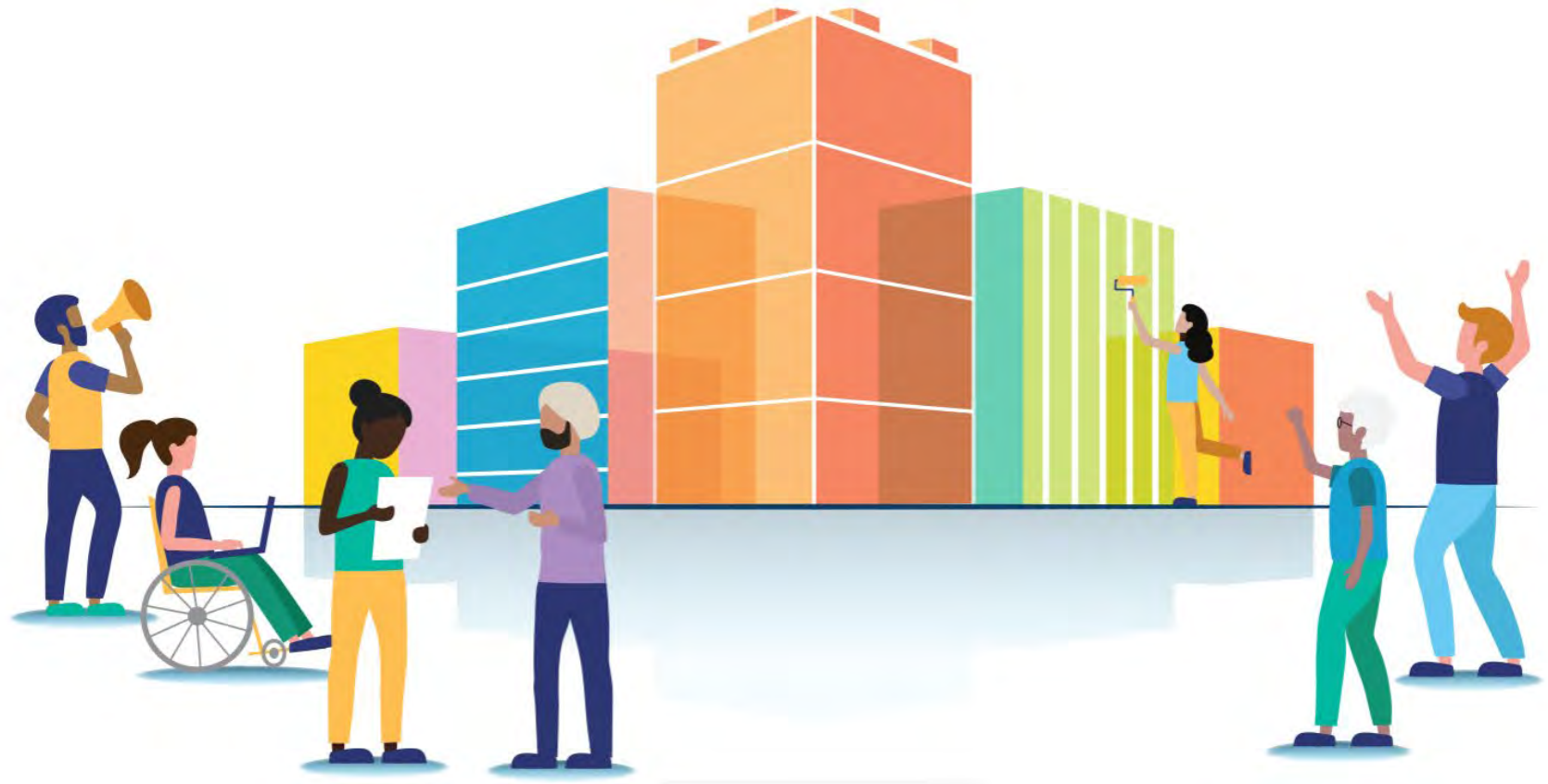
IPAWS

Technology enables the future of EP

National Preparedness

FEMA

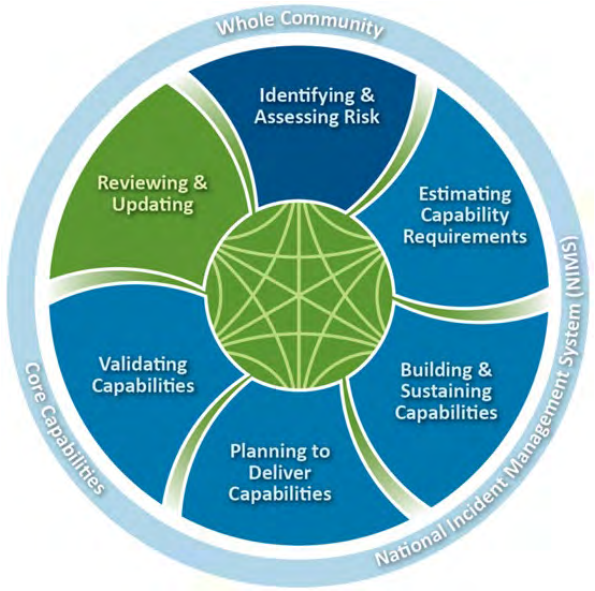
Preparedness is Whole Community



FEMA

National Preparedness System

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

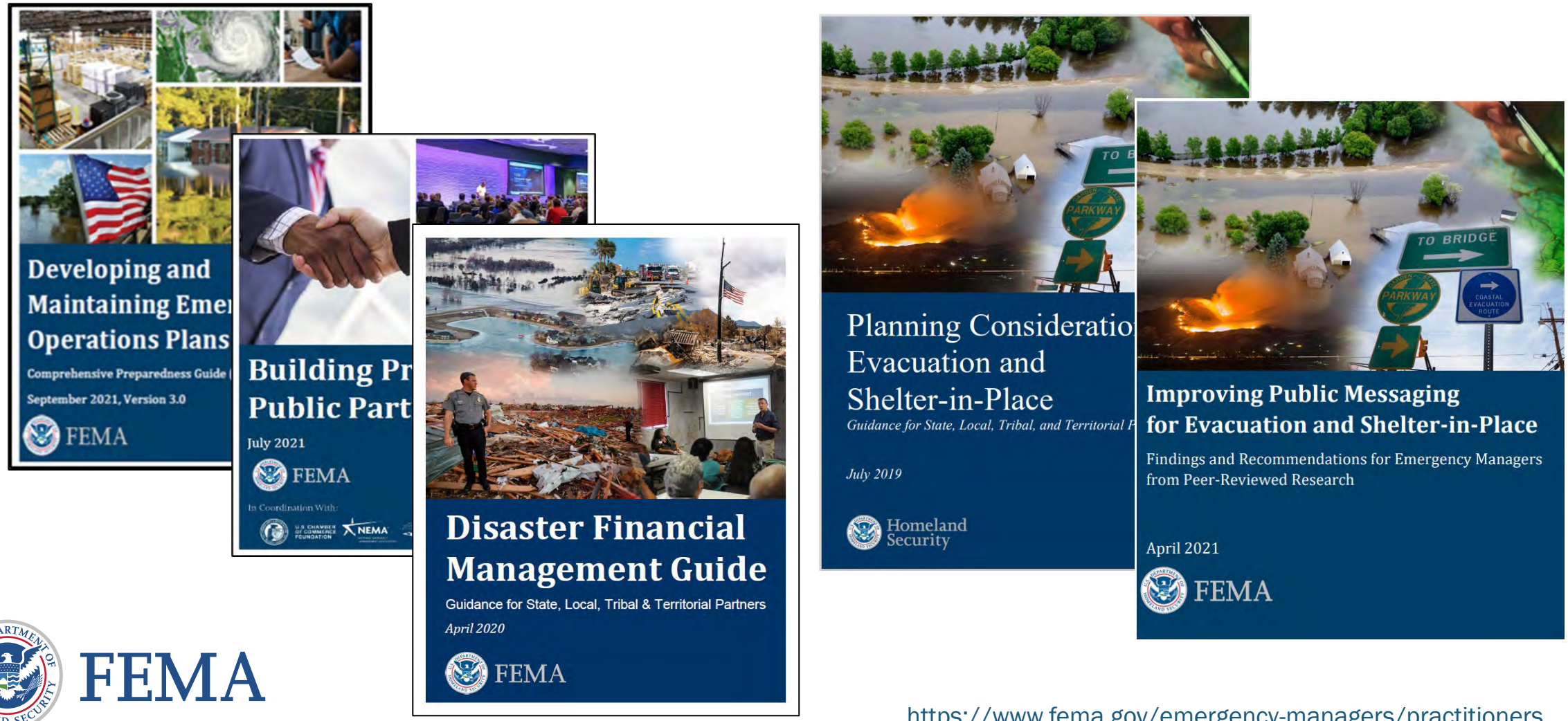


A **secure and resilient nation** with the **capabilities** required across the **whole community** to **prevent**, **protect** against, **mitigate**, **respond** to, and **recover** from the **threats and hazards** that pose the **greatest risk**.

FEMA

https://www.fema.gov/emergency-managers/national-preparedness

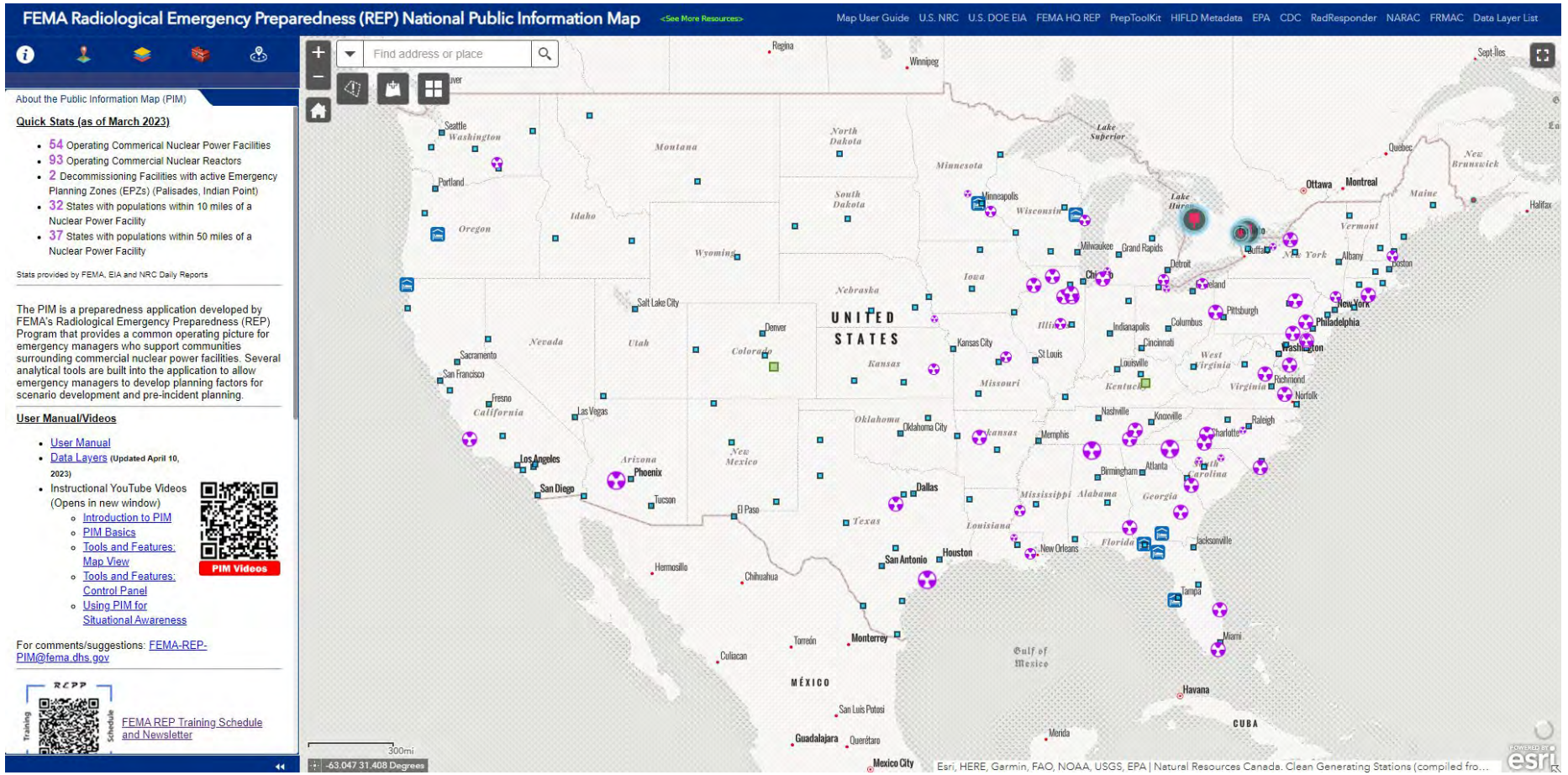
Preparing for Disasters



FEMA

https://www.fema.gov/emergency-managers/practitioners

Radiological Emergency Preparedness (REP) Program



FEMA

https://www.fema.gov/emergency-managers/practitioners/hazardous-response-capabilities/radiological

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FEMA

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Protecting People and the Environment