

NRC Fundamentals of Emergency Preparedness

**Beaver Valley Power Station
August 13, 2015**

Robert Kahler, Branch Chief

- Robert Kahler, Branch Chief
- NSIR/DPR/IRIB
 - Office of Nuclear Security & Incident Response
 - Division of Preparedness & Response
 - Inspection and Regulatory Improvements Branch



NRC Public Web Site

www.nrc.gov

• HOME | [FAQ](#) | [GLOSSARY](#) | [FACILITY LOCATOR](#) | [WHAT'S NEW](#) | [SITE HELP](#) | [INDEX A-Z](#) | [CONTACT US](#) | [EMAIL UPDATES](#) | [LISTEN TO PAGE](#)



United States Nuclear Regulatory Commission
Protecting People and the Environment

[REPORT A SAFETY CONCERN](#)

[NUCLEAR REACTORS](#) | [NUCLEAR MATERIALS](#) | [RADIOACTIVE WASTE](#) | [NUCLEAR SECURITY](#) | [PUBLIC MEETINGS & INVOLVEMENT](#) | [NRC LIBRARY](#) | [ABOUT NRC](#)



Facility Locator
Locate Now » a facility near you.

— STAY CONNECTED —





PROTECTING PEOPLE and the ENVIRONMENT

1 2 3 4 5

Commission Meeting Webcasts

Next Commission Webcast
(August 13, 2015 at 8:55 a.m.)

Event Reports

Reports Associated with Events
[Read more »](#)

ADAMS Public Documents

Search and view NRC's public documents
[Read more »](#)

Open Government

NRC Approach to Open/Digital Government
[Read more »](#)

Students & Teachers

Information for Students and Teachers
[Read more »](#)

In a Nuclear Emergency ...

Know what to do
[Read more »](#)

Spotlight

- OPM Data Breach
- Watts Bar Nuclear Plant Unit 2
- Regulatory Information Conference
- Commission Documents
- Fire Protection Program for Operating Reactors
- Japan Lessons Learned
- Seabrook Concrete Degradation
- NRC Safety Culture Policy Statement
- Tribal Policy Statement
- Underground Reactor Pipes and Trillum
- New Reactor Construction
- For the Record

[Spotlight Archive »](#)

News & Speeches

August 6, 2015

Atomic Safety and Licensing board to Take Public Comment, Hold Hearing Aug. 24 on Crow Butte Uranium Recovery Facility

[More News »](#) [More Speeches »](#)

Public Meetings

August 11 2015

S	M	Tu	W	Th	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

[Prev](#) [Today](#) [Next](#)



NRC Public Web Site

www.nrc.gov

★ HOME | [FAQ](#) | [GLOSSARY](#) | [FACILITY LOCATOR](#) | [WHAT'S NEW](#) | [SITE HELP](#) | [INDEX A-Z](#) | [CONTACT US](#) | [EMAIL UPDATES](#) | [LISTEN TO PAGE](#)



United States Nuclear Regulatory Commission
Protecting People and the Environment

SEARCH

REPORT
A SAFETY CONCERN

[NUCLEAR REACTORS](#) | [NUCLEAR MATERIALS](#) | [RADIOACTIVE WASTE](#) | [NUCLEAR SECURITY](#) | [PUBLIC MEETINGS & INVOLVEMENT](#) | [NRC LIBRARY](#) | [ABOUT NRC](#)



Facility Locator

[Locate Now](#) » a facility near you.

— STAY CONNECTED —

[Blog](#) [Facebook](#) [Twitter](#) [YouTube](#) [RSS](#)



NRC Chairman Steps
the NRC's Headquar
plant conditions dur

The Commission
Organization & Functions
Governing Legislation
Plans, Budget, & Performance
Locations
History
Values
Direction-Setting & Policymaking

Research Activities
Radiation Protection
Fire Protection
Safety Culture
How We Regulate
[Emergency Preparedness & Response](#)
Public Emergency Preparedness & Response Opportunities
Congressional Affairs

International Programs
State & Tribal Programs
Alternative Dispute Resolution Programs
Civil Rights
Contact Us
Career Opportunities
Small Businesses
Grant Opportunities



documents
[Read more »](#)

Spotlight

OPM Data Breach
Watts Bar Nuclear Plant Unit 2
Regulatory Information Conference
Commission Documents
Fire Protection Program for Operating Reactors
Japan Lessons Learned
Seabrook Concrete Degradation
NRC Safety Culture Policy Statement
Tribal Policy Statement
Underground Reactor Pipes and Tritium
New Reactor Construction
For the Record

[Spotlight Archive »](#)

News & Speeches

August 6, 2015

 Atomic Safety and Licensing board to Take Public Comment, Hold Hearing Aug. 24 on Crow Butte Uranium Recovery Facility

[More News »](#) [More Speeches »](#)

Public Meetings

August 11 2015

S	M	Tu	W	Th	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

[« Prev](#) [Today](#) [Next »](#)



Open Government

 NRC Approach to Open/Digital Government
[Read more »](#)

Students & Teachers

 Information for Students and Teachers
[Read more »](#)

In a Nuclear Emergency ...

 Know what to do
[Read more »](#)

NRC Public Web Site

www.nrc.gov/about-nrc/emerg-preparedness.html



The screenshot shows the NRC website's "Emergency Preparedness & Response" page. The header includes the NRC logo, navigation links (HOME, FAQ, GLOSSARY, FACILITY LOCATOR, WHAT'S NEW, SITE HELP, INDEX A-Z, CONTACT US, EMAIL UPDATES, LISTEN TO PAGE), a search bar, and a "REPORT A SAFETY CONCERN" button. A secondary navigation bar lists categories: NUCLEAR REACTORS, NUCLEAR MATERIALS, RADIOACTIVE WASTE, NUCLEAR SECURITY, PUBLIC MEETINGS & INVOLVEMENT, NRC LIBRARY, and ABOUT NRC. The left sidebar, titled "ABOUT NRC", contains a list of topics, with "Emergency Preparedness & Response" highlighted. The main content area features the title "Emergency Preparedness & Response" and a paragraph explaining the NRC's role in emergency planning. To the right of the text is a "KEY TOPICS" box with links to various resources. Below the main text is a "Frequently Asked Questions" section with a question mark icon and a thumbnail image of a document titled "SCOUT THE EMERGENCY EXPOSURE".

HOME | FAQ | GLOSSARY | FACILITY LOCATOR | WHAT'S NEW | SITE HELP | INDEX A-Z | CONTACT US | EMAIL UPDATES | LISTEN TO PAGE

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

SEARCH

REPORT
A SAFETY CONCERN

NUCLEAR REACTORS | NUCLEAR MATERIALS | RADIOACTIVE WASTE | NUCLEAR SECURITY | PUBLIC MEETINGS & INVOLVEMENT | NRC LIBRARY | ABOUT NRC

PRINT

Home > About NRC > Emergency Preparedness & Response

Emergency Preparedness & Response

Good planning leads to good response. Our emergency preparedness programs enable emergency personnel to rapidly identify, evaluate, and react to a wide spectrum of emergencies, including those arising from terrorism or natural events such as hurricanes. Our incident response program integrates the overall NRC capabilities for the response and recovery of radiological incidents and emergencies involving facilities and materials regulated by the NRC or an Agreement State. Under the National Response Framework, the NRC will coordinate with other Federal, State, and local emergency organizations in response to various types of domestic events. The NRC emphasizes the integration of safety, security, and emergency preparedness as the basis for the NRC's primary mission of protecting public health and safety. Our review of the emergency preparedness programs reaffirmed that our emergency planning bases remain valid under the current threat environment. The NRC's Office of Nuclear Security and Incident Response (NSIR) has the primary responsibility for these essential agency functions.

- About Emergency Preparedness
- About Emergency Response
- How Can I Prepare for a Radiological Emergency?
- What Do I Do in a Nuclear Emergency?
- Public Meetings and Workshops
- Rulemaking Activities
- Regulations, Guidance, and Generic Communications
- Related Information and Other Resources
- Newsletter
- Contact Us

KEY TOPICS

- Hurricane Preparedness
[EXIT](#)
- Emergency Exercise Schedule
- FEMA After Action Reports (Emergency Exercises)
- Stakeholder Meetings and Workshops
- Emergency Action Level Development
- Rulemaking Activities
- Frequently Asked Questions/Emergency Preparedness Guidance Clarification

Frequently Asked Questions



Workshop Overview

- Role of the NRC in the Federal Government
- Introduction and History of EP at NRC
- Emergency Classifications
- EP Regulations, Guidance and Generic Communications
- EP Inspection Program and Enforcement
- EP Going Forward



Role of the NRC in the Federal Government

Executive Branch

- Comprised of several different entities:
 - Executive Office of the President
 - Support staff and Councils
 - Executive departments
 - e.g., DHS, Department of State, Department of Defense
 - Independent agencies and government corporations
 - e.g., NRC, Tennessee Valley Authority (TVA)
 - Quasi-Official agencies
 - e.g., Smithsonian Institution



NRC Commissioners



**Commissioner
Jeff
Baran**



**Commissioner
Kristine L.
Svinicki**



**Chairman
Stephen G.
Burns**



**Commissioner
William C.
Ostendorff**

Vacant
?

NRC Staff

- Approximately 3800 staff working at NRC HQ in Rockville, MD, four regional offices, and a training center:
 - Region I King of Prussia, PA
 - Region II Atlanta, GA
 - Region III Lisle, IL
 - Region IV Arlington, TX
 - Technical Training Center, Chattanooga, TN
- Directed by Executive Director for Operations (EDO)
 - carries out policies and decisions of Commission



Introduction and History of EP at the Nuclear Regulatory Commission

Emergency Preparedness

- Overall objective/philosophy of EP at NRC
 - There is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency
 - Reasonable Assurance finding made before facility licensed
 - Inspected over lifetime of facility
 - defense-in-depth
 - not based on probability of accident
 - EP is for **ALL** initiating events
 - Operational accident, natural disaster, or terrorist attack



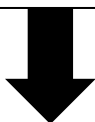
History of EP Requirements

- 1958 – Atomic Energy Commission (AEC)
 - Outlines procedures for radiological emergency response
- 1966 – Advisory Committee on Reactor Safeguards (ACRS)
 - Raised concern regarding adequacy of emergency planning as plant size increased
- 1970 – AEC drafted guidelines for public comment
 - New Appendix E to 10 CFR Part 50
 - Onsite and Offsite
- 1973 – AEC designated as lead agency for radiological emergency planning



Atomic Energy Act of 1954

Made development of
commercial nuclear
energy possible



Atomic Energy Commission (AEC)

- development and production of nuclear weapons
- development and regulation of civilian uses of nuclear materials
- Sought to ensure public health and safety without inhibiting nuclear industry growth

Energy Reorganization Act of 1974

Addressed conflict of interest between
regulating & promoting nuclear power



Nuclear Regulatory Commission January 19, 1975 (Independent agency)

- license and regulate civilian nuclear materials
 - may enter into agreements to delegate authority over some materials to states
- license and regulate civilian nuclear facilities
- does not regulate defense nuclear facilities

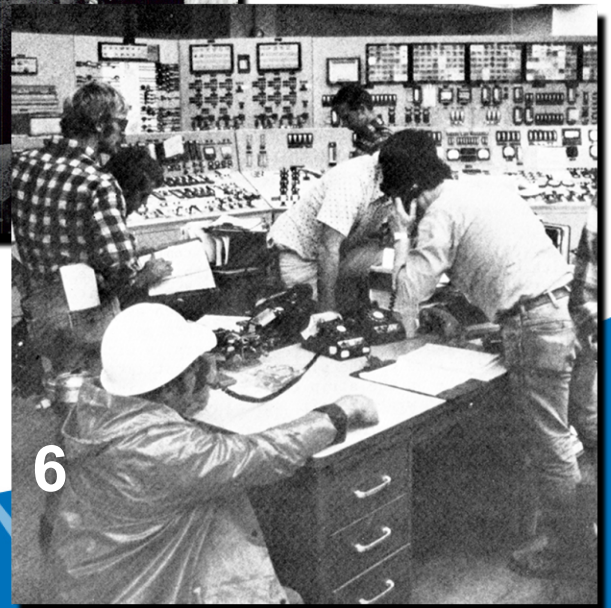
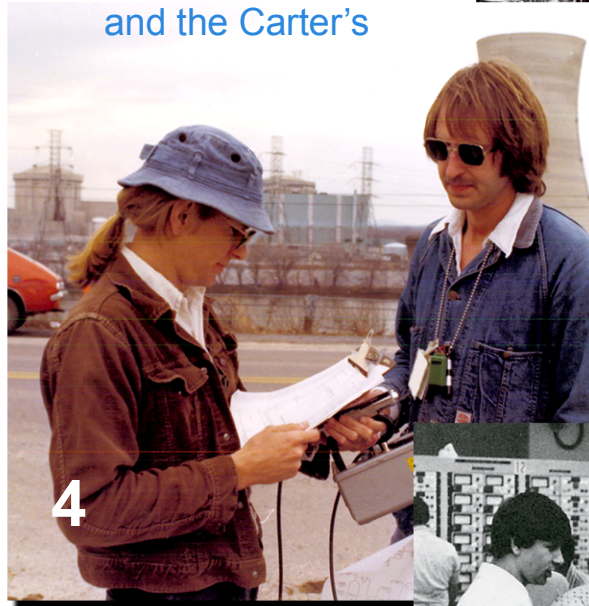


Department of Energy (Cabinet agency)

- development and production of nuclear weapons
- promotion of nuclear power
- other energy-related work



1. The "JIC"
2. Gov. Thornburg and Pres. Jimmy Carter
3. Harold Denton and the Carter's



4. Rad Techs
5. Unit 2 CR (G. Miller plant mgr. on left)
6. Unit 2 Control Room

History of EP Requirements

- Post-Three Mile Island
 - General Accounting Office (GAO) urged adoption of EPZ concept
 - FEMA designated lead agency for offsite oversight
 - MOU delineating FEMA and NRC roles
 - NRC retained responsibility for judging whether or not the “overall state of emergency preparedness” was satisfactory for licensing, considering FEMA findings regarding offsite preparedness



History of EP Requirements



Seabrook Siren Trucks

History of EP Requirements

- March 28, 1979
- September 11, 2001
- March 11, 2011
- November 23, 2011

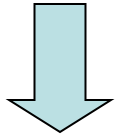


Emergency Classifications

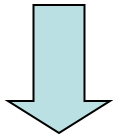
- Unusual Event (UE)
 - No release expected
- Alert
 - Release a small fraction of EPA PAGs
- Site Area Emergency (SAE)
 - Release not expected to exceed EPA PAG levels beyond site boundary
- General Emergency (GE)
 - Releases reasonably expected to exceed EPA PAG levels offsite
 - NOTE: GE does **NOT NECESSARILY** mean a release is in progress

Flow of Events

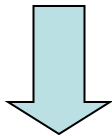
- Initiating Condition (IC)



- Emergency Action Level (EAL)



- Emergency Classification Level (ECL)



- Offsite Actions, if necessary

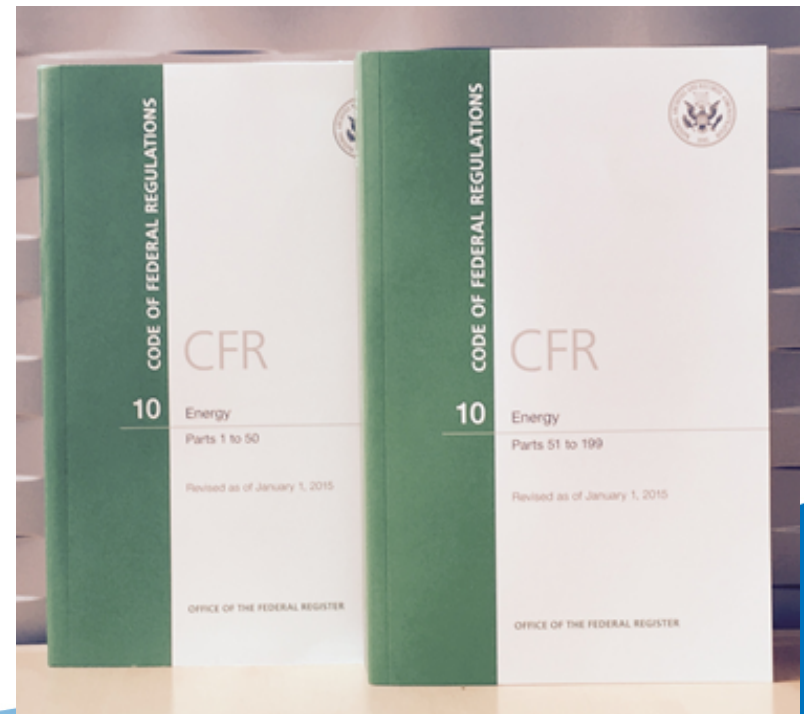


EP Regulations and Guidance Generic Communications

EP Regulations

Title 10, Code of Federal Regulations, Part 50


- 10 CFR 50.47(b)
-- the 16 planning standards
- 10 CFR 50 Appendix E
- 10 CFR 50.54(q)
- 10 CFR 50.54(t)
- 10 CFR 50.72




NRC EP Public Web Site

www.nrc.gov/about-nrc/emerg-preparedness/regs-guidance-comm


[HOME](#) | [FAQ](#) | [GLOSSARY](#) | [FACILITY LOCATOR](#) | [WHAT'S NEW](#) | [SITE HELP](#) | [INDEX A-Z](#) | [CONTACT US](#) | [BROWSE ALOUD](#) | [EMAIL UPDATES](#)




United States Nuclear Regulatory Commission
Protecting People and the Environment

 **REPORT**
A SAFETY CONCERN

[NUCLEAR REACTORS](#) | [NUCLEAR MATERIALS](#) | [RADIOACTIVE WASTE](#) | [NUCLEAR SECURITY](#) | [PUBLIC MEETINGS & INVOLVEMENT](#) | [NRC LIBRARY](#) | [ABOUT NRC](#)

[PRINT](#)  [SHARE](#) 

 **EMERGENCY PREPAREDNESS AND RESPONSE**

- About Emergency Preparedness
- About Emergency Response
- How Can I Prepare for a Radiological Emergency?
- What Do I Do in a Radiological Emergency?
- Public Meetings and Workshops
- Rulemaking Activities
- Regulations, Guidance, and Generic Communications**
- Related Information and Other Resources
- Newsletter
- Contact Us



Spotlight

Home > About NRC > Emergency Preparedness and Response > Regulations, Guidance, and Generic Communications

Regulations, Guidance, and Generic Communications

To prepare for a radiological emergency, NRC developed regulations, guidance, and communications related to emergency preparedness for nuclear power plants.

On this page:

- [Regulations](#)
- [Guidance](#)
- [Generic Communications](#)

This page includes links to files in non-HTML format. See [Plugins, Viewers, and Other Tools](#) for more information.

Regulations

NRC's regulations are found in Chapter I, "Nuclear Regulatory Commission," of Title 10, "Energy," of the Code of Federal Regulations (CFR). Chapter I is divided into Parts 1 through 199. The following are the principal parts governing emergency preparedness for nuclear power plants:

- **10 CFR 50.47**, "Emergency Plans," includes the 16 planning standards of 50.47(b) and the "Realism Rule" recognizing that State and local government officials do their best to protect the public health and safety in 50.47(c)
- **Appendix E to 10 CFR Part 50**, "Emergency Planning and Preparedness for Production and Utilization Facilities," describes information needed to demonstrate compliance with emergency preparedness requirements in Section IV, "Content of Emergency Plans"
- **10 CFR 50.54(q)**, requirements for following and maintaining in effect emergency plans

See also [Rulemaking Activities for Emergency Preparedness and Response](#).

10 CFR 50.47(b)

- 16 Planning Standards
 - Must be met in licensee and State and local emergency plans
 - Supplemented by requirements in Appendix E
 - Supporting guidance in NUREG-0654/FEMA-REP-1 and FEMA REP Manual
 - Power reactor sites only
 - FEMA 44 CFR 350 is nearly identical
 - Direct relationship to NUREG-0654
 - (1)=A, (2)=B, etc.

10 CFR 50.47(b)

16 Planning Standards

- | | |
|---------------------------|---------------------------|
| (1) Responsibilities | (9) Accident Assessment |
| (2) Onsite ERO | (10) Protective Actions |
| (3) Response Support | (11) Rad Exposure Control |
| (4) Classification Scheme | (12) Medical Support |
| (5) Notifications | (13) Recovery & Reentry |
| (6) Communications | (14) Exercises & Drills |
| (7) Public Education | (15) Training |
| (8) Emergency Facilities | (16) Plan Maintenance |

10 CFR 50 Appendix E

Emergency Planning and Preparedness for Production and Utilization Facilities"

- Contains requirements for emergency plans for all applications under Part 50 and Part 52
 - Binding on license applicants and licensees
- Invokes the planning standards in § 50.47(b) for power reactors, and contains supporting requirements



10 CFR 50.54(q)

- § 50.54(q), Emergency Plan
 - § 50.54(q)(1) defines terminology
 - § 50.54(q)(2) follow and maintain the effectiveness
 - § 50.54(q)(3) and (4) make changes to emergency plan without prior NRC approval:
 - Does not result in Reduction in Effectiveness (RIE)
 - continues to meet Appendix E and § 50.47(b)
 - Changes that do not meet these criteria must be submitted for prior NRC review and approval as a license amendment

10 CFR 50.54(t)

- Periodic review of licensee's EP program
- Evaluation of licensee's drills and exercises and emergency response capabilities
- Adequacy of interface with offsite agencies
- Report is made available to State and local governments



10 CFR 50.72 - Notifications

- Emergencies
 - Notify NRC immediately following notification of State and local agencies and not later than one hour after declaration
 - Immediately notify NRC of emergency class escalation
 - Maintain open line with NRC
- Non-emergency events
 - Any event that results in a major loss of:
 - emergency assessment capability
 - offsite response capability
(e.g., alert and notification system)
 - offsite communications capability



EP Guidance

- Regulatory Guide 1.101
 - Provides an acceptable method for licensee compliance with regulations for the content of emergency plans
- Regulatory Guide 1.219
 - Guidance on making changes to Emergency Plans
- NUREG-0654/FEMA-REP-1
 - Licensee guidance for complying with § 50.47(b) & App E
 - ORO guidance for complying with 44 CFR 350.5

EP Guidance

- NUREG-0396 (EPA 520/1-78-018)
 - Introduced generic Emergency Planning Zones (EPZs)
- NUREG-0696
 - Functional Criteria for Emergency Response Facilities
- EAL Scheme Guidance

Generic Communications

- NUREG
- Regulatory Guide (RG)
- Information Notice (IN)
- Regulatory Issue Summary (RIS)



NUREG Uses

- NRC staff guidance and instructions
- Licensing action procedures and acceptance criteria
- Staff suggested course of action
- Not a substitute for regulations
- No compliance required
- Licensees may propose alternatives



NUREG Types

- Publications prepared by NRC
Example: NUREG-0696
- Brochures prepared by NRC staff
Example: NUREG/BR-0314
- Conference proceedings prepared by NRC or contractors
Example: NUREG/CP-XXXX
- Publications prepared by NRC contractors
Example: NUREG/CR-7002
- Publications resulting from international agreements
Example: NUREG/IA-XXXX



Regulatory Guide (RG)

1. Power reactors
2. Research and test reactors
3. Fuels and materials facilities
4. Environmental and siting
5. Materials and plant protection
6. Products
7. Transportation
8. Occupational health
9. Antitrust and financial review
10. General



RG Functions

- Acceptable methods to implement regulations
- Evaluation techniques for specific problems or postulated accidents
- Contains data required for reviewing permit and license applications
- Not substitute for regulations
- No compliance required
- Licensees may propose alternatives

Information Notice (IN)

- Recently identified significant operating experience (OE)
- Recently completed research results
- Licensees evaluate information notices for applicability
- IN 2005-19, *“Effect of Plant Configuration Changes on the Emergency Plan”*



RIS Functions

- Informs licensees of technical or policy positions not previously communicated or fully understood
- Reports NRC endorsement of industry developed documents
- Solicit voluntary pilot program participation
- Informs licensees of regulatory relief opportunities
- Announces regulatory documents issuance
- Requests voluntary submittal of information for NRC administration of regulatory process

EP Inspection Program and Enforcement

Emergency Preparedness Cornerstone

- 3 Performance Indicators
- Baseline Inspection Program



Performance Indicators

- Drill and Exercise Performance (DEP)
- Emergency Response Organization Drill Participation (ERO)
- Alert and Notification System Performance (ANS)



Baseline Inspections

- IP 71114 Attachments .01 - .08
 - Exercise Evaluation (biennial exercise)
 - Alert and Notification System Testing
 - Emergency Response Organization Augmentation
 - Emergency Action Levels And Plan Changes
 - Maintenance of Emergency Preparedness
 - Drill Evaluation (resident inspector)
 - Exercise Evaluation (hostile action)
 - Scenario Evaluation

Significance Levels

- **Green** Very low safety significance (licensee response band)
- White Low to moderate safety significance (increased regulatory response band)
- **Yellow** Substantial safety significance (required regulatory response band)
- **Red** High safety significance (unacceptable performance band)



EP Going Forward

Topics: The Future of EP

- Revision to NUREG-0654/FEMA-REP-1
- Fukushima Near-Term Task Force Recommendations
- Outreach
- Decommissioning



Revision to NUREG-0654/FEMA-REP-1

- Target for issuance of Revision 2 is Early 2017
- Coordination with FEMA
 - NUREG-0654 is joint document between NRC & FEMA
- Public Comment Period



Fukushima

- Tiered Approach to Recommendations
- Tier 1 – Without Delay
 - Staffing and Communications
- Tier 2 – as resources are available
 - Multi-unit dose assessment
 - Equipment and facilities needed during station blackout
 - Training and exercises for multi-unit and SBO scenarios
- Tier 3 – long term
 - Advanced Notice of Proposed Rulemaking (ANPR)
 - Multi-unit events and SBO
 - Distribution of Potassium Iodide (KI) beyond 10 miles
 - Public Education
 - EPZ size



Current Outreach

- FEMA regional planning meetings
- NREP Conference
- NEI Communications Forum
- Regulatory Information Conference
- Webpage
- Quarterly EP Newsletter
 - emergencypreparedness.resource@nrc.gov



Decommissioning Reactors

- Permanently cease operations
 - Kewaunee Nuclear Power Plant
 - San Onofre Nuclear Generating Station
 - Crystal River-3 Nuclear Power Plant
 - Vermont Yankee Nuclear Power Station
 - Oyster Creek Nuclear Generating Station (2019)
- Decommissioning EP Rulemaking
 - Advanced Notice of Proposed Rulemaking (ANPR)
 - 2019

Contact Information

Robert Kahler

Office: (301) 287-3756

email: robert.kahler@nrc.gov

