

# NRC Emergency Preparedness Regulations and Guidance

NEI Emergency Preparedness Training Course  
for  
New Licensee EP Managers

U.S. Nuclear Regulatory Commission  
Policy and Oversight Branch  
Division of Preparedness and Response  
Office of Nuclear Security and Incident Response

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# EP Regulations

*Title 10, Code of Federal Regulations, Part 50*

- 10 CFR 50 Appendix E
- 10 CFR 50.47(b)
  - the 16 planning standards
- 10 CFR 50.47(c)(1)
- 10 CFR 50.54(q)
- 10 CFR 50.54(t)
- 10 CFR 50.72

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# 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
- Contains the requirements for emergency plans for *non-power reactors*
- Contains *supporting requirements* for the planning standards in §50.47(b) for power reactors
- Emergency plans are a part of power reactor applicant’s Final Safety Analysis Report (FSAR), Chapter 13
- Examples
  - Requires the capability to notify State and local authorities within 15 minutes of emergency declaration
  - Defines equipment and facility needs
  - Defines exercise and training expectations

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# Planning Standards 10 CFR 50.47(b)

*The onsite and, except as provided in paragraph (d) of this section, offsite emergency response plans for nuclear power reactors must meet the following standards:*

- |                                |                                |
|--------------------------------|--------------------------------|
| (1)Responsibilities assigned   | <b>(9)Accident assessment</b>  |
| <b>(2)Onsite ERO</b>           | <b>(10)Protective actions</b>  |
| (3)Emer. Response support      | (11)Radiation exposure control |
| <b>(4)EALs</b>                 | (12)Medical & health support   |
| <b>(5)Notification Methods</b> | (13)Recovery and Reentry       |
| (6)Emer. Communications        | (14)Exercises & Drills         |
| (7)Public education & info     | (15)Training                   |
| <b>(8)Emergency facilities</b> | (16)Plan maintenance           |

*Notes:*

- *FEMA 44 CFR 350.5 has a nearly identical set of planning standards.*
- *Direct relationship with NUREG-0654 (1=A, 2=B, etc.)*
- ***RSPS = 4, 5, 9, & offsite part of 10***
- ***Direct impact on effective EPlan implementation = (b)(2) and (b)(8)***

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# 10 CFR 50.47(b)(1)

*Primary responsibilities for emergency response by the nuclear facility licensee and by State and local organizations within the EPZs have been assigned, emergency responsibilities of the various supporting organizations have been specifically established, and each principal response organization has staff to respond and to augment its initial response on a continuous basis.*

- **Translated:**
  - Responsibilities for onsite/offsite personnel/organizations are established to support 24/7 coverage
- **Examples:**
  - Emergency response organizational chart
  - Position descriptions

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# 10 CFR 50.47(b)(2)

*On-shift facility licensee responsibilities for emergency response are unambiguously defined, adequate staffing to provide initial facility accident response in key functional areas is maintained at all times, timely augmentation of response capabilities is available and the interfaces among various onsite response activities and offsite support are specified.*

- **Translated:**

- Transition from normal duties to emergency responsibilities; ensuring sufficient on-shift emergency staff at all times; timely augmentation of on-shift staff; and identifying offsite emergency resources

- **Examples:**

- Shift Manager becomes Emergency Director
- Licensee Table B-1
- Identify offsite response entities to respond onsite such as local ambulance agency(s), fire department(s), police, hospital(s), etc., and obtain MOU's

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# 10 CFR 50.47(b)(3)

*Arrangements for requesting and effectively using assistance resources have been made, arrangements to accommodate State and local staff at the licensee's near-site EOF have been made, and other organizations capable of augmenting the planned response have been identified.*

- **Translated:**

- Federal, State, and local governmental assistance is arranged with space available in EOF for their response and other technical organizations as needed by the plan

- **Examples:**

- INPO

- State Officials

- Utility Owners Group

- Local Officials

- Coast Guard

- Federal Officials

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# 10 CFR 50.47(b)(4)

*A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, and State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.*

- **Translated:**
  - Ability to classify an emergency via a standard scheme
- **Examples:**
  - Emergency Action Levels
  - ORO Standard Operating Plans (SOPs) entry conditions

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# 10 CFR 50.47(b)(5)

*Procedures have been established for notification, by the licensee, of State and local response organizations and for notification of emergency personnel by all organizations; the content of initial and follow-up messages to response organizations and the public have been established; and the means to provide early notification and clear instruction to the populace within the plume exposure pathway EPZ have been established.*

- **Translated:**
  - Capability to provide notification and response instructions to onsite/offsite emergency response personnel and the public.
- **Examples:**
  - Call out list
  - Notification Forms
  - EAS Messages
  - Alert and Notification Systems (ANS)
  - Tone Alert Radios

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# 10 CFR 50.47(b)(6)

*Provisions exist for prompt communications among principal response organizations to emergency personnel and to the public*

- ***Translated:***
  - Have plans for contacting all necessary OROs and emergency personnel
- ***Examples:***
  - Pagers, Cell Phones, Blackberries
  - NRC Emergency Notification System
  - Direct ringdown phones from licensee to counties/States
  - WebEOC™

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# 10 CFR 50.47(b)(7)

*Information is made available to the public on a periodic basis on how they will be notified and what their initial actions should be in an emergency, the principal points of contact with the news media for dissemination of information during an emergency are established in advance, and procedures for coordinated dissemination of information to the public are established.*

- ***Translated:***
  - Information on nuclear power plant emergencies shall be provided annually to the general public and the media
- ***Examples:***
  - JICs
  - Phone Books
  - Annual Mailers, Calendars
  - Annual Media Training

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# 10 CFR 50.47(b)(8)

*Adequate emergency facilities and equipment to support the emergency response are provided and maintained.*

- **Translated:**
  - Provide and maintain all facilities and equipment necessary to support emergency response at all times.
- **Examples:**
  - TSC, OSC, EOF, Backup EOF, JICs
  - Air Samplers, Computers,
  - Emergency Kits (survey equipment and supplies, personnel protective equipment)
  - Onsite & Offsite Monitoring Systems
  - Met towers

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# 10 CFR 50.47(b)(9)

*Adequate methods, systems, and equipment for **assessing and monitoring actual or potential offsite consequences** of a radiological emergency condition are in use.*

- **Translated:**
  - Ability to monitor and assess radiological release
- **Examples:**
  - Dose modeling software
  - Core damage estimation tools
  - Field monitoring
  - Correlations of plant parameters to source term of releases

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# 10 CFR 50.47(b)(10)

*A range of protective actions has been developed for the plume exposure pathway EPZ for emergency workers and the public. In developing this range of actions, consideration has been given to evacuation, sheltering and as a supplement to these, the prophylactic use of potassium iodide as appropriate. Evacuation time estimates have been developed by applicants and licensees. Licensees shall update the evacuation time estimates on a periodic basis. Guidelines for the choice of protective actions during an emergency, consistent with Federal guidance, are developed and in place, and protective actions for the ingestion exposure pathway EPZ appropriate to the locale have been developed.*

- **Translation:**
  - Have a set of preplanned protective actions (that must consider evacuation and sheltering – potassium iodide is a possible supplement, but not a replacement) that can be implemented based on radiological conditions for both EPZs
- **Examples:**
  - Develop guidelines, strategies, and means for implementing a range of PARs for both plant personnel and the public
  - Use ETEs in PAR development
  - Evacuation sector maps
  - Onsite Assembly Areas
  - List of Dairy Farms within 50 miles

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# 10 CFR 50.47(b)(11)

*Means for controlling radiological exposures, in an emergency, are established for emergency workers. The means for controlling radiological exposures shall include exposure guidelines consistent with EPA Emergency Worker and Lifesaving Activity Protective Action Guides.*

- **Translated:**
  - Have a plan for protecting and directing plant personnel that must respond to radiological hazards during an emergency and base it on the EPA guidance
- **Examples:**
  - Provisions for authorizing and control radiation exposures greater than occupational limits in support of response actions
    - Lifesaving actions
  - Emergency worker dosimetry both onsite and offsite
  - Decontamination facilities

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# 10 CFR 50.47(b)(12)

*Arrangements are made for **medical services for contaminated injured individuals.***

- **Translated:**

- Arrangements made with ambulance and hospitals responsible for contaminated injured personnel
- Arrangements made for evaluating and treating radiation overexposures

- **Examples:**

- Evaluated drills with ambulance and hospital personnel
- Onsite emergency medical squads

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# 10 CFR 50.47(b)(13)

*General plans for recovery and reentry are developed.*

- ***Translated:***
  - Create a framework for recovering from an emergency
- ***Examples:***
  - Event termination and/or de-escalation criterion pre-established in the emergency plan

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# 10 CFR 50.47(b)(14)

*Periodic exercises are (will be) conducted to evaluate major portions of emergency response capabilities, periodic drills are (will be) conducted to develop and maintain key skills, and deficiencies identified as a result of exercises or drills are (will be) corrected.*

- **Translated:**

- Evaluated and training exercises/drills are conducted to identify and correct weaknesses and maintain proficiency

- **Examples:**

- Onsite ERO drills
- Biennial Evaluated Exercise (FEMA)
- Licensed Operator Requal (LOR) Drills
- Fire Drills
- Critiques

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# 10 CFR 50.47(b)(15)

*Radiological emergency response training is provided to those who may be called on to assist in an emergency.*

- **Translated:**
  - Training to onsite and offsite emergency response personnel
- **Examples:**
  - Fire department training on decontamination efforts
  - Classroom training on classifying emergencies

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# 10 CFR 50.47(b)(16)

*Responsibilities for plan development and review and for distribution of emergency plans are established and planners are properly trained.*

- **Translation:**
  - An emergency planning department is established with qualified personnel
- **Examples:**
  - Initial and continuous training of EP department staff
  - Annual review of emergency plan

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# Realism Rule

*What happens if a State or local government refuses to participate in emergency planning?*

- 10 CFR 50.47(c)(1)
  - Provides means for an applicant to obtain a license when State or local governments decline or fail to participate adequately in offsite emergency planning
  - Applicant/licensee may:
    - Demonstrate that deficiencies in emergency plans are not significant
    - Show that adequate interim compensatory actions have been or will be taken promptly
    - Assert that other compelling reasons exist that would permit plant operations

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## 10 CFR 50.54(q)

- §50.54 contains requirements that are conditions in every power reactor operating license.
- §50.54(q) addresses the licensee's Emergency Plan
  - Licensees are required to follow and maintain the effectiveness of emergency plans which meet the requirements in Appendix E, and for power reactors, the planning standards of §50.47(b)
  - Allows licensees to make changes to their emergency plan without prior Commission approval as long as it does not represent a Reduction in Effectiveness (RIE) of the plan and the plan continues to meet the requirements in Appendix E, and for power reactors, the planning standards of §50.47(b)
  - Changes that do not meet these criteria must be submitted for prior NRC review as a license amendment
  - Most EP violations are cited against §50.54(q)

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## 10 CFR 50.54(t)

- Requires licensees provide for the development, revision, implementation and maintenance of its EP program
- Requires a periodic review of all program elements of the licensee's EP program by persons having no direct responsibility for implementation of EP Program, including:
  - Evaluation of adequacy of interfaces with State and local governments
  - Evaluation of licensee's drills and exercises and emergency response capabilities and procedures
- Results of review and recommendations are documented, reported to corporate and plant management, and retained for 5 year period
  - Portion of report addressing onsite-offsite interfaces is made available to State and local governments

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# 10 CFR 50.72

- Licensee notifications to NRC regarding EP
  - Notify the NRC immediately following notification of State and local agencies and not later than one hour after declaration of **any** of the emergency classes
  - Activate the ERDS as soon as possible and not later than one hour following declaration of an Alert or higher emergency class
  - Make immediate follow-up notifications as conditions change or new data becomes available; maintain open communication channel upon request by the NRC.
- EP related non-emergency eight hour report: 10 CFR 50.72(b)(3)(xiii)
  - Any event that results in a major loss of emergency assessment capability, offsite response capability, or offsite communications capability (e.g., significant portion of control room indication, ENS, or offsite notification system).

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# End of Regulations

- *Now for guidance on how to meet the regulations*

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# NUREG-0396 (EPA 520/1-78-016)

*“Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plants”*

- Joint NRC/EPA Task Force formed in 1976
- Issued December 1978
- Determined the appropriate degree of emergency response planning efforts around nuclear power plants
- Introduced Generic Emergency Planning Zones (EPZs) concept as basis for planning of response actions
- Provides basis for federal/State/local government emergency response

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# NUREG-0654/FEMA-REP-1

*“Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants”*

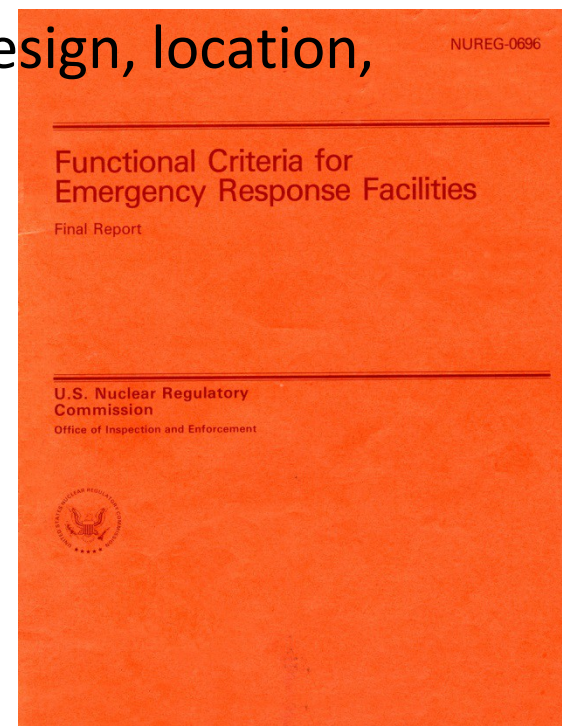
- Product of a joint NRC/FEMA Steering Committee
- Guidance and criteria for satisfying 10 CFR 50.47(b) and Appendix E
  - NRC has endorsed NUREG-0654 to be an acceptable approach to complying with the regulations, e.g., guidance
  - FEMA incorporated NUREG-0654 by reference into 44 CFR 350
- Organized to link back to the regulations

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# NUREG-0696

## *Functional Criteria for Emergency Response Facilities*

- February 1981
- Safety Parameter Data System (SPDS)
- Guidance on emergency response facility design, location, functions, capabilities
  - Control Room (during an emergency)
  - Technical Support Center (TSC)
  - On-Site Operations Center (OSC)
  - Emergency Operations Facility (EOF)
- Integrated support to the Control Room
- Updated in NSIR/DPR-ISG-01



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# EAL Scheme Guidance

- NUREG-0654 Appendix 1, *“Emergency Action Level Guidelines for Nuclear Power Plants”*
- NUMARC/NESP-007, *“A Methodology for Development of Emergency Action Levels”*
- NEI 99-01, *“Methodology for Development of Emergency Action Levels”*
  - Added EALs for permanently shutdown reactors and dry cask spent fuel storage
  - Improvements to NUMARC/NESP-007
- NEI-07-01, Rev. 0, *“Methodology for Development of Emergency Action Levels Advanced Passive Light Water Reactors”*
  - Developed for AP-1000 and ESBWR reactors

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# Regulatory Guide 1.101

*“Emergency Planning and Preparedness in Support of Nuclear Power Reactors”*

Issued to provide an acceptable method for licensee compliance with regulations for the content of emergency plans

- Revision 1 (1977)
  - Criteria for plans to cope with emergencies and serious accidents emphasized need for procedures to implement drills and exercises
- Revision 2 (1981)
  - Endorsed NUREG-0654/FEMA-REP-1
- Revision 3 (1992)
  - Endorsed NUMARC/NESP-007, Methodology for Development of EALs
  - Could use either 0654 or 007, but not portions of both

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## Regulatory Guide 1.101 (continued)

- Revision 4 (2003)
  - Endorsed NEI 99-01, Methodology for Development of EALs
  - RIS 2003-18 issued to describe EAL change approval process
- Revision 5 (2005)
  - Provides guidance for co-located licensees
  - Draft guidance for co-located licensees
- Revision 6 (2021)
  - Captured previous endorsement of NEI 99-01 revisions, and NEI 07-01
  - Endorsed an option for justifying a 24-month 50.54(t) frequency

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## Other Guidance

- NSIR/DPR-ISG-01, *Interim Staff Guidance Emergency Planning for Nuclear Power Plants*
- NSIR/DPR-ISG-02, *Interim Staff Guidance Emergency Planning Exemption Requests for Decommissioning Nuclear Power Plants*
- NUREG/CR-7002, *Criteria for Development of Evacuation Time Estimate Studies*
- Regulatory Guide 1.219, *Guidance on Making Changes to Emergency Response Plans for Nuclear Power Reactors*
- Endorsed NEI Guidance (e.g., NEI 10-05, NEI 13-01, NEI 06-04)

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# Other NUREGs

- NUREG/CR-7032
  - *Developing an Emergency Risk Communication (ERC)/Joint Information Center (JIC) Plan for a Radiological Emergency*
- NUREG/CR-7033
  - *Guidance on Developing Effective Radiological Risk Communication Messages: Effective Message Mapping and Risk Communication with the Public in Nuclear Plant Emergency Planning Zones*
- NUREG-0737, Supp. 1
  - *Clarification of TMI Action Plan Requirements*

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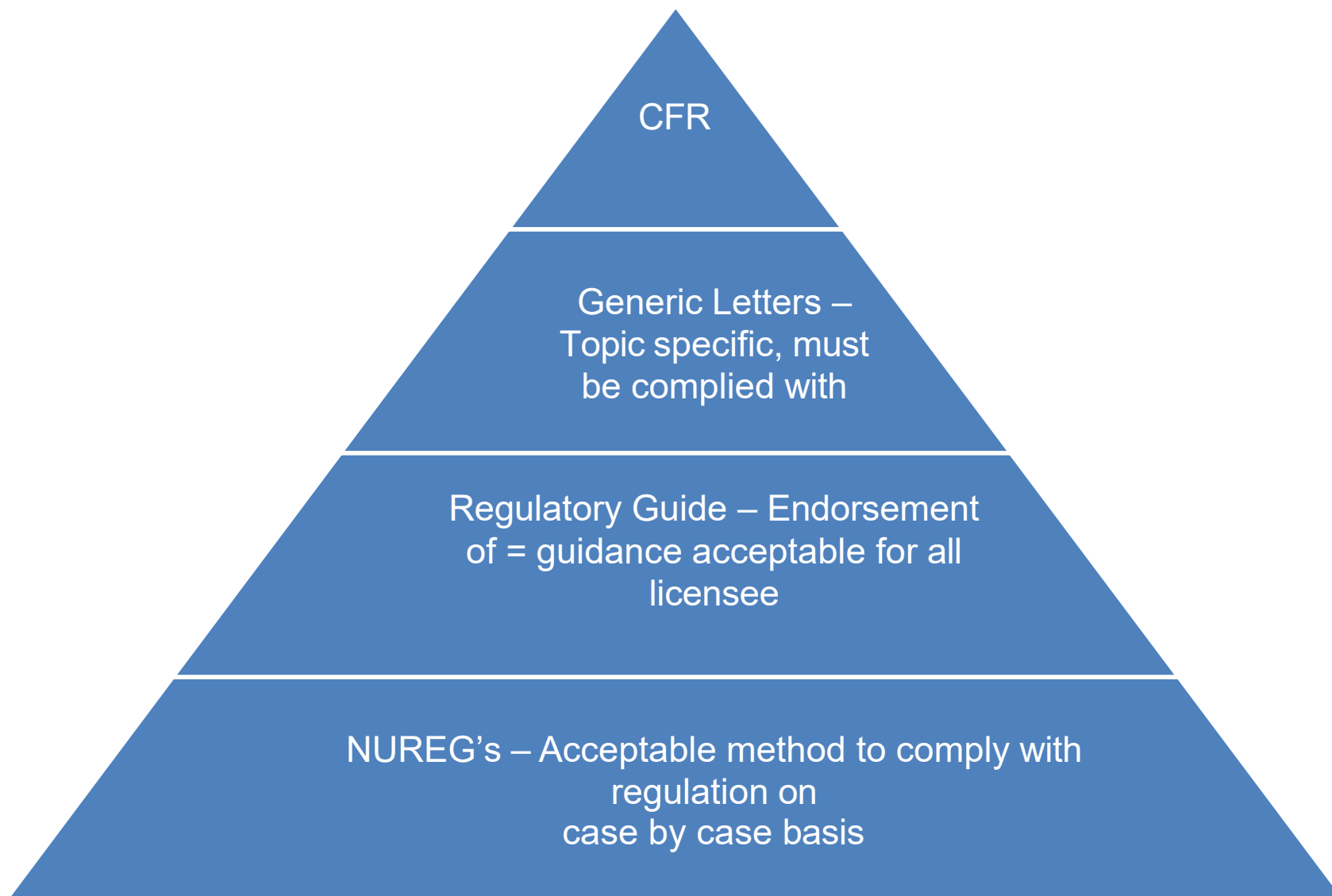
# Generic Communications

- NUREG
- Interim Staff Guidance
- Regulatory Guide
- Bulletin
- Information Notice
- Regulatory Issue Summary
- 10 CFR 50.54(f) letter
- A complete list of EP-related generic communications can be found at:
- <http://www.nrc.gov/about-nrc/emerg-preparedness/regs-guide-comm/ep-generic-comm.html>

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# Generic Communications

- Commission's EP Regulations in 10 CFR Part 50
  - Must be complied with, unless exempted
- Regulatory Guides
  - Provides acceptable method for complying with a particular regulation(s); licensee can propose alternative
- NUREGs
  - A staff or contractor prepared technical report
  - May be endorsed in a regulatory guide as an acceptable method for complying with regulations
- Generic Letters
  - Topic specific, licensee action required
- Bulletins, Regulatory Issue Summaries, Information Notices
  - Topic specific information, licensee action not required



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# QUESTIONS?