

NRC Updates

NUREG-0654/FEMA-REP-1, Rev 2

On-Site Focus

Southeast Radiological Emergency Preparedness Workshop

February 12, 2020
Nashville, TN

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NRC Updates

- EP Rulemaking Activities
 - Decommissioning
 - Small Modular Reactor & Other New Technologies
- ETE Guidance: NUREG/CR-7002 Update
- EP Research
- NUREG-0654/FEMA-REP-1 Revision 2

Transition to Decommissioning Rulemaking

Graded Approach to EP

Level 1 — Permanent cessation of operations and all fuel in spent fuel pool

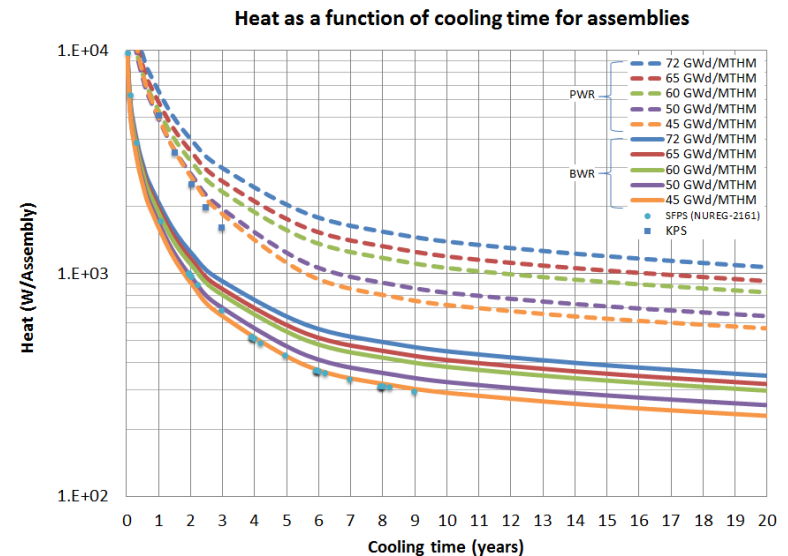
Level 2 — Spent fuel has sufficiently decayed (10 hour adiabatic heatup time)

Level 3 — All fuel is in dry cask storage

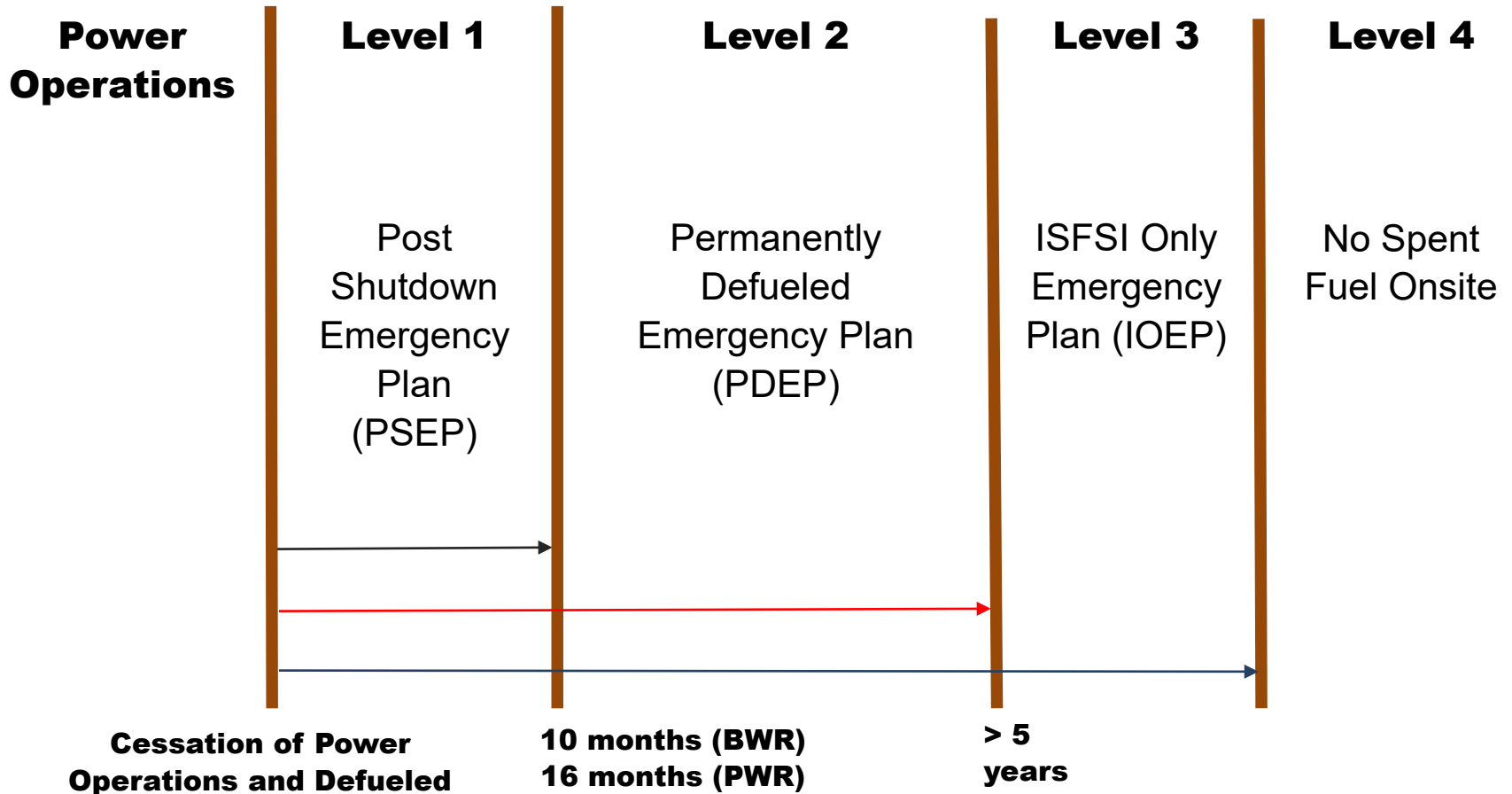
Level 4 — All fuel removed from site

Research to Support Rulemaking

- **NUREG-1738**, “Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants”
- **NUREG-2161**, “Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor”
- **Supporting Research Studies**
(ADAMS ML16110A416)
 - Analysis of Mitigative Actions
 - Spent Fuel Decay Time
 - Dose Rate of Accidental Radiological Release from Spent Fuel Pool

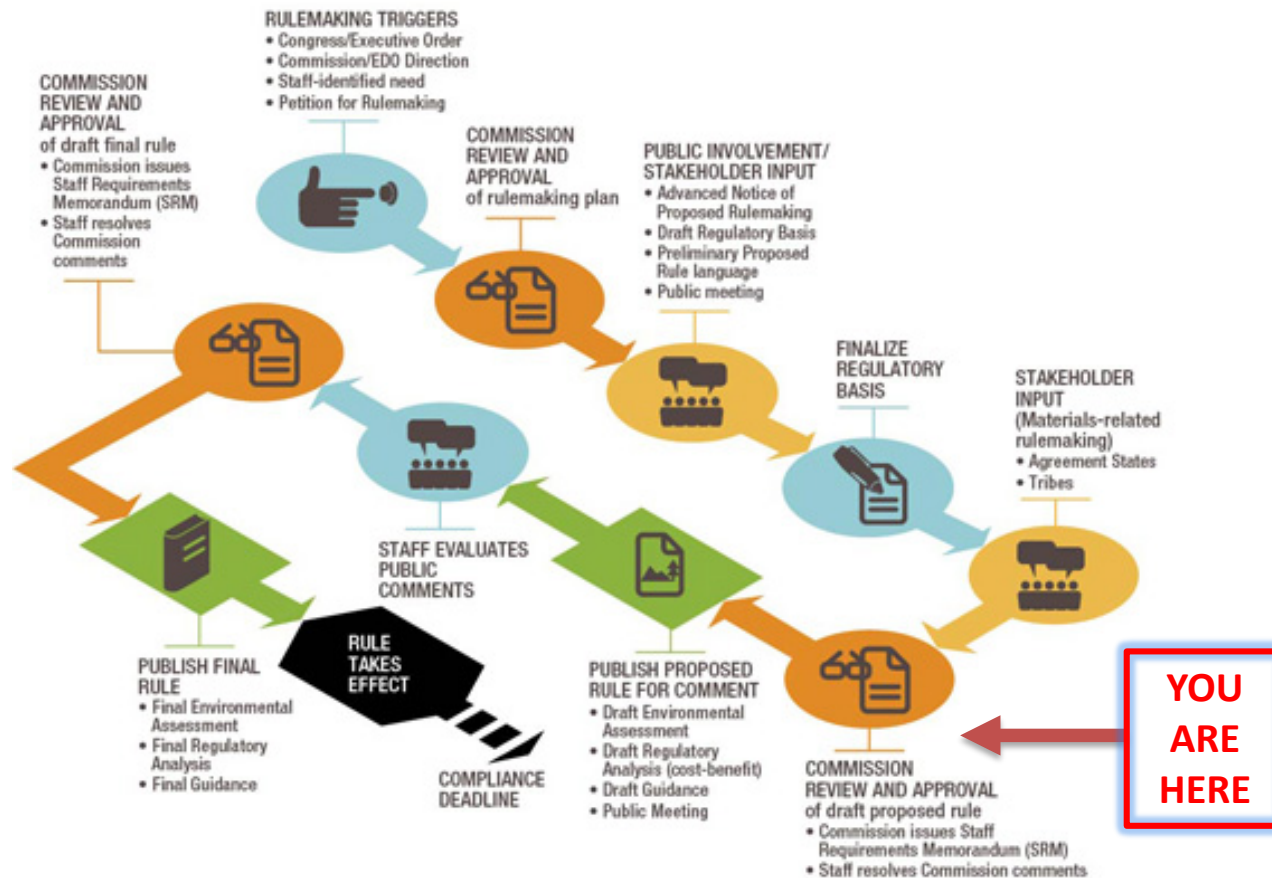


Decommissioning EP Levels



Decommissioning Rulemaking

A TYPICAL RULEMAKING PROCESS



Decommissioning Rule Schedule

- Final Regulatory Basis
 - November 2017, ML17215A012
- Proposed Rule/Draft Regulatory Guidance
 - Provided to Commission May 7, 2018
 - Public May 22, 2018, ML18012A019
- Rulemaking Information
 - nrc.gov RIN Number: 3150-AJ59
 - Regulations.gov Docket ID NRC-2015-0070

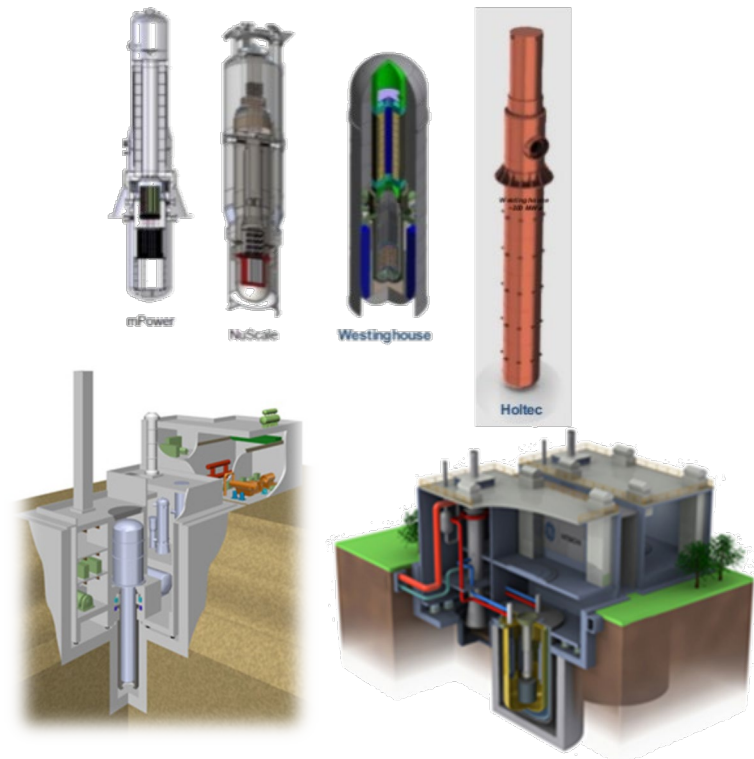
EP for SMRs & ONT Rulemaking

- Rulemaking to develop a clear set of rules and guidance for small modular reactors (SMRs) and other new technologies (ONT)

Technology Neutral or Inclusive

Risk-Informed, Performance Based

Principle of dose-at-distance and consequence-oriented approach to determine EPZ size



SMR & ONT Rulemaking

- Performance Activities
 - Event classification and mitigation
 - Assessment
 - Protective actions
 - Communications
 - Command and control
 - Staffing and operations
 - Protective equipment
 - Releases
 - Reentry
 - Critique and Corrective Actions

SMR & ONT Rulemaking

- All Facilities
 - Public Information
 - Implementing Safeguards Contingency Plan concurrent with Emergency Plan
 - Establish Voice Communications with NRC
 - Establish Emergency Facilities

SMR & ONT Rulemaking

- EPZ beyond the site boundary
 - Contacts and Arrangements
 - Offsite organization descriptions
 - Protective measures
 - Site familiarization training
 - Evacuation time estimates
 - Offsite emergency response facilities
 - Dose projections
 - Public information, ANS, prompt action descriptions
 - Reentry
 - Drills and exercises

SMR & ONT Rule Schedule

- Final Regulatory Basis
 - November 2017, ML17206A265
- Proposed Rule/Draft Regulatory Guidance
 - August 3, 2018, Publicly Available, ML18213A264
 - August 22, 2018, Advisory Committee on Reactor Safeguards Subcommittee
- Rulemaking Information
 - nrc.gov RIN Number: 3150-AJ68
 - Regulations.gov Docket ID NRC-2015-0225

NUREG/CR-7002

- Criteria for Development of ETE Studies
 - ETE Study completed in 2018
 - Informed revisions to NUREG/CR-7002
 - Intend to issue prior to next decennial ETE updates.
- How can the ETE Study Enhance Guidance?
 - Impact of Shadow Evacuation
 - Distance of Evacuation Travel
 - Modeling and Use of Manual Traffic Control
 - Parameters of Importance

EP Research

Non-radiological Impacts of Implementing Protective Actions

- October 3, 2003, Commission directed staff to:
“continue to evaluate the NRC protective action recommendation guidance to assure that it continues to reflect our current state of knowledge with regard to evacuation and sheltering. Update the guidance, as necessary.”
- Current US and International research indicates that there may be significant deterministic health consequences associated with evacuations and prolonged relocations not specific to the hazard.
- Compelling evidence from Chernobyl and Fukushima of a broad range of consequences
 - psycho-social and mental health impact following relocation, ruptured social links, disconnected family ties and stigmatization (WHO).

Motivation for Research Study

- *the risk to health from a protective action should not itself exceed the risk to health from the dose that would be avoided.*
- Are we doing more harm than good?
 - Are evacuations and relocations more harmful than the radiological hazard?
 - What is driving the health impacts?
- Are the PAGs balanced against the risk?
 - Stochastic risk vs. deterministic health impact
- How do we change our thinking and improve protective action decision-making?
 - What information do decision-makers need?

Criteria for

Preparation and Evaluation of Radiological
**EMERGENCY RESPONSE
PLANS AND PREPAREDNESS**

in Support of Nuclear Power Plants

Final Report

NUREG-0654/FEMA-REP-1 Revision 2

- Regulations.gov NRC Docket ID NRC-2018-0261
- Federal Register Notice
 - December 23, 2019, 84 FR 70399
- Final Document
 - ADAMS ML19347D139
- Comment Resolution Report
 - ADAMS ML19350A378

NUREG-0654/FEMA-REP-1 Revision 2

- Updated and modernized emergency planning information while refocusing the evaluation criteria on overall emergency preparedness (EP) program capabilities deemed essential to meet each of the EP planning standards found in NRC regulations at 10 CFR 50.47(b) and FEMA regulations at 44 CFR 350.5(a).

NUREG-0654/FEMA-REP-1 Revision 2

- Section I Introduction
 - Clarified origins of responsibilities and authorities
 - Addresses use of document
 - Includes Tribal Governments
 - Clarifies use of alternate approaches to meet EP standards
 - While an alternate approach does not relax the requirements of the planning standards, it provides an opportunity to propose an alternative method for meeting the intent of the planning standards.

NUREG-0654/FEMA-REP-1 Revision 2

- Section I Introduction
- Use by Applicants and Licensees
 - Voluntarily use the guidance in this document to demonstrate compliance with the underlying NRC regulations
 - *Voluntarily* means that the licensee is seeking the action of its own accord, without the force of a legally binding requirement or an NRC representation of further licensing or enforcement action.
 - Methods or solutions that differ from those described in this document may be deemed acceptable if an applicant or licensee makes available sufficient bases and information for the NRC staff to evaluate whether the proposed alternative(s) meet the intent of the planning standards.

NUREG-0654/FEMA-REP-1 Revision 2

- Section I Introduction
- Use by Applicants and Licensees
 - Changes made to currently approved revision 1 plans will continue to be evaluated using Revision 1.
 - Licensees may also use guidance based on Revision 2 to make emergency plan changes.
 - Any changes based on Revision 2 will be evaluated using Revision 2
 - Licensees should indicate the revision on which the changes are based
 - Applicants and licensees may seek approval of a new emergency plan based on Revision 1, Revision 2, or a combination of Revisions 1 and 2.

NUREG-0654/FEMA-REP-1 Revision 2

- Section II Planning Standards and Evaluation Criteria
 - Changes made to clarify evaluation criteria
 - Criteria address **capabilities** rather than specific methods
 - Outdated references, terminology and titles were removed in an effort to maintain “timeless” language
 - All previously issued supplements, appendices, and the addenda have either been folded into revision 2, the FEMA REP Program Manual, or are reflected in various NRC guidance documents
 - evaluation criteria written without the use of “should” and “shall” to avoid implying evaluation criteria are requirements
 - NUREG-0654/FEMA-REP-1, Rev. 2 is a guidance document.

Section II Planning Standards and Evaluation Criteria

Planning Standard A

- Editorial changes to improve clarity
- Provision for providing the legal basis for authorities pertaining to emergency response was broadened
- Detailed information regarding documentation of agreements among organizations was relocated to FEMA REP Program Manual and is reflected in various NRC guidance documents

Section II Planning Standards and Evaluation Criteria

Planning Standard B

- Evaluation criteria added to ensure licensees and applicants develop onsite EROs in accordance with applicable NRC regulations, and that EP functions are not assigned to individuals who may have competing tasks
- Evaluation criterion regarding identification of local support agencies was moved to Planning Standard C to better align with the intent of the planning standard
- Table B-1 was revised
 - to clarify existing and add new onsite EP functions
 - remove on-shift staffing numbers to recognize that on-shift staffing levels will be determined by site-specific on-shift staffing analyses
 - eliminate the column for 30-minute augmented staffing
 - provide additional clarifying notes for developing and documenting the on-shift and ERO augmentation staffing plan.

Section II Planning Standards and Evaluation Criteria

Planning Standard C

- Evaluation criteria expanded to include all resources that could be provided from a variety of sources and not just those provided by the Federal government.
- Provisions for supporting offsite resources responding to the nuclear power plant site were added.
- Arrangements for integrating the licensee's response with NRC response are now addressed
- Provisions for activating the NRC's Emergency Response Data System (ERDS) were added

Section II Planning Standards and Evaluation Criteria

Planning Standard D

- Provisions added for ensuring the emergency classification action level scheme conforms to NRC regulations and appropriate guidance is used for developing emergency action levels, including discussion with and agreement by offsite response organizations (OROs) and an annual review between all parties
- Evaluation criterion added to ensure licensees have the capability to assess, classify, and declare an emergency condition within 15 minutes after availability of indications that an emergency action level has been met or exceeded.

Section II Planning Standards and Evaluation Criteria

Planning Standards E and F

- Overall terminology was updated and changes were made to reflect the updated requirements that were part of the NRC's 2011 EP rulemaking
- Timely supplemental information updates are now addressed in Planning Standard E
- Detailed information regarding emergency notification content was relocated to the FEMA REP Program Manual and is reflected in various NRC guidance documents

Section II Planning Standards and Evaluation Criteria

Planning Standards G

- Detailed information regarding the content of public information materials and public information programs was relocated to the FEMA REP Program Manual and is reflected in various NRC guidance documents.
- Introduces the use of joint information system (JIS) concepts for coordination and dissemination of information to the public and the media
- The need for information to be disseminated using multiple methods to include non-English translations per current Federal guidance is more specifically addressed

Section II Planning Standards and Evaluation Criteria

Planning Standard H

- Evaluation criterion added to address licensee provisions for an alternative facility that would be accessible during hostile action
- An evaluation criterion regarding the location of the Joint Information Center was added.
- Provisions for OROs to identify an alternate emergency operations center were added.

Section II Planning Standards and Evaluation Criteria

Planning Standard I

- Evaluation criterion regarding licensee radiological assessment capabilities was revised to address events occurring for all reactor core and spent fuel sources at a plant site simultaneously.
- Additional specific parameters needed for performing radiological assessments were added.
- Evaluation criterion added to address OROs accounting for methods to assess contamination of drinking water through liquid release pathways or deposition of airborne materials for a nuclear power plant located on or near a body of water from which public drinking water is drawn. This revision was made in response to the drinking water protective action guides (PAGs) released by the Environmental Protection Agency (EPA) in 2017

Section II Planning Standards and Evaluation Criteria

Planning Standard J

- Provisions added for emphasizing that latest evacuation time estimate (ETE) information is incorporated into emergency plans and considered in the development of a site-specific protective action recommendation strategy
- Evaluation criteria addressing relocation concepts are now addressed more specifically

Section II Planning Standards and Evaluation Criteria

Planning Standard K

- Evaluation criteria were updated to align with current exposure control guidance and address radiation protection briefings.
- Provisions were added to address dosimetry for offsite responders arriving onsite

Section II Planning Standards and Evaluation Criteria

Planning Standard L

- Separate onsite and offsite evaluation criteria for medical services were created due to the range of radiological injuries that could occur at a nuclear power plant site
- Enhancements made to address radiation overexposure treatment and licensee radiological controls
- Evaluation criteria were added to address contamination control during transport of patients, as well as decontamination of transport vehicles

Section II Planning Standards and Evaluation Criteria

Planning Standard M

- Information was added to more fully address reentry, recovery, and return planning as well as reoccupancy planning as described in the latest version of the EPA PAG Manual. This includes the addition of “reoccupancy” concepts. .
- Further detail was added to address continuity during transfer of responsibility between incident phases and development of sampling plans.

Section II Planning Standards and Evaluation Criteria

Planning Standard N

- Required biennial exercise scenario elements currently found in NRC regulations have been added
- Evaluation criteria were added to address various types of drills, including laboratory, ingestion pathway, off-hours report-in, and off-hours call-in drills
- Evaluation criteria for medical drills have been separated into onsite and offsite activities
- Clarification was provided for environmental monitoring drills.

Section II Planning Standards and Evaluation Criteria

Planning Standard O

- The evaluation criteria were simplified to account for the numerous training requirements, programs, and types of training available and necessary to maintain the appropriate level of radiological emergency response knowledge and skills.

Section II Planning Standards and Evaluation Criteria

Planning Standard P

- Provision was added for tracking and addressing licensee EP program-related issues
- Provision was added for ensuring licensees evaluate changes in plant configuration for their impact on the effectiveness of the emergency plan

Section III Resources

- A Resources Section was added
 - Includes the pertinent NRC and FEMA authorities under which the EP programs for commercial nuclear power plants are regulated.
 - Includes specific references to other relevant guidance for licensees and state, local, and tribal government organizations.
- Additional key programmatic terms were added to the Glossary.

Appendices

- **Appendix 1** – Emergency Action Level Guidelines for Nuclear Power Plants
 - Emergency action level and initiating condition information has been replaced by latest version of NRC-endorsed industry guidance (currently NEI 99-01, Rev. 6).
 - Emergency classification level definitions were added to the Glossary in new Section III.
 - Concepts regarding immediate actions to be taken have been addressed in various evaluation criteria.
- **Appendix 2** – Meteorological Criteria for Emergency Preparedness at Operating Nuclear Power Plants (including Annex 1)
 - Addressed in NRC Regulatory Guide 1.23, “Meteorological Monitoring Programs for Nuclear Power Plants

Appendices

- **Appendix 3** – Means for Providing Prompt Alerting and Notification of Response Organizations and the Population
 - Appendix addressed in the FEMA REP Program Manual and is reflected in various NRC guidance documents.
- **Appendix 4** – Evacuation Time Estimates within the Plume Exposure Pathway Emergency Planning Zone
 - Replaced by NUREG/CR-7002.
- **Appendix 5** – Glossary
 - Relocated to the Glossary in new Section III.

Supplements

- **Supplement 1** – Criteria for Utility Offsite Planning and Preparedness
 - Information was incorporated into Section I.
- **Supplement 2** – Criteria for Emergency Planning in an Early Site Permit Application
 - Information was incorporated into Section I.
- **Supplement 3** – Guidance for Protective Action Strategies
 - Information was incorporated into applicable Planning Standard J evaluation criteria.
 - Additional information addressed in FEMA REP Program Manual and reflected in various NRC guidance documents.
- **Supplement 4** – Criteria for National Preparedness Initiative Integration, Exercise Enhancement, and Backup Alert and Notification Systems
 - Information was incorporated into applicable evaluation criteria in Planning Standards E and N.
 - Additional information addressed in FEMA REP Program Manual and reflected in various NRC guidance documents.

Contact Information

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