



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

Final Report

U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, DC 20555-0001

Federal Emergency Management Agency
Office of National Preparedness
Washington, DC 20472



AVAILABILITY OF REFERENCE MATERIALS IN NRC PUBLICATIONS

NRC Reference Material

As of November 1999, you may electronically access NUREG-series publications and other NRC records at NRC's Public Electronic Reading Room at www.nrc.gov/NRC/ADAMS/index.html.

Publicly released records include, to name a few, NUREG-series publications; *Federal Register* notices; applicant, licensee, and vendor documents and correspondence; NRC correspondence and internal memoranda; bulletins and information notices; inspection and investigative reports; licensee event reports; and Commission papers and their attachments.

NRC publications in the NUREG series, NRC regulations, and *Title 10, Energy*, in the Code of *Federal Regulations* may also be purchased from one of these two sources.

1. The Superintendent of Documents
U.S. Government Printing Office
Mail Stop SSOP
Washington, DC 20402-0001
Internet: bookstore.gpo.gov
Telephone: 202-512-1800
Fax: 202-512-2250
2. The National Technical Information Service
Springfield, VA 22161-0002
www.ntis.gov
1-800-553-6847 or, locally, 703-605-6000

A single copy of each NRC draft report for comment is available free, to the extent of supply, upon written request as follows:

Address: Office of the Chief Information Officer,
Reproduction and Distribution
Services Section
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
E-mail: DISTRIBUTION@nrc.gov
Facsimile: 301-415-2289

Some publications in the NUREG series that are posted at NRC's Web site address www.nrc.gov/NRC/NUREGS/indexnum.html are updated periodically and may differ from the last printed version. Although references to material found on a Web site bear the date the material was accessed, the material available on the date cited may subsequently be removed from the site.

Non-NRC Reference Material

Documents available from public and special technical libraries include all open literature items, such as books, journal articles, and transactions, *Federal Register* notices, Federal and State legislation, and congressional reports. Such documents as theses, dissertations, foreign reports and translations, and non-NRC conference proceedings may be purchased from their sponsoring organization.

Copies of industry codes and standards used in a substantive manner in the NRC regulatory process are maintained at—

The NRC Technical Library
Two White Flint North
11545 Rockville Pike
Rockville, MD 20852-2738

These standards are available in the library for reference use by the public. Codes and standards are usually copyrighted and may be purchased from the originating organization or, if they are American National Standards, from—

American National Standards Institute
11 West 42nd Street
New York, NY 10036-8002
www.ansi.org
212-642-4900

Legally binding regulatory requirements are stated only in laws; NRC regulations; licenses, including technical specifications; or orders, not in NUREG-series publications. The views expressed in contractor-prepared publications in this series are not necessarily those of the NRC.

The NUREG series comprises (1) technical and administrative reports and books prepared by the staff (NUREG-XXXX) or agency contractors (NUREG/CR-XXXX), (2) proceedings of conferences (NUREG/CP-XXXX), (3) reports resulting from international agreements (NUREG/IA-XXXX), (4) brochures (NUREG/BR-XXXX), and (5) compilations of legal decisions and orders of the Commission and Atomic and Safety Licensing Boards and of Directors' decisions under Section 2.206 of NRC's regulations (NUREG-0750).

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

Final Report

Manuscript Completed: February 2002

Date Published: March 2002

Prepared by
NRC/FEMA Working Group

**Division of Inspection Program Management
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001**

**Technological Services Division
Office of National Preparedness
Federal Emergency Management Agency
Washington, DC 20472**



ADDENDA TO NUREG-0654/FEMA-REP-1, Rev. 1

The following citations replace the outdated citations referred to in Revision 1 to NUREG-0654/FEMA-REP-1. The page, section, and footnote (FN), as appropriate, are given for each original citation. These addenda do not include any citation that is still valid.

1. **Page 2, Section I.B, FN 1 states that agency responsibilities will be promulgated “in the near future” by FEMA.**

FEMA promulgated in 44 CFR 351, Subparts B and C, concerning the responsibilities of other Federal agencies regarding the development and promulgation of guidance for the preparation, review, and testing of radiological emergency response plans.

2. **Page 3, Section I.B refers to the “proposed FEMA rule.”**

FEMA issued final rules on emergency plans and preparedness in 44 CFR Parts 350, 351, 352, 353, and 354.

3. **Page 3, Section I.B, FN 2 refers to future guidance on transportation accidents.**

FEMA issued FEMA-REP-5, Rev. 2, “Guidance for Developing State, Tribal, and Local Radiological Emergency Response Planning and Preparedness for Transportation Accidents,” as a final document in November 2000.

4. **Page 6, Section I.B, FN 3 refers to the “EPA Manual of Protective Action Guides and Protective Actions for Nuclear Incidents,” EPA-52011-75-001, September 1975.**

EPA issued the “EPA Manual of Protective Action Guides and Protective Actions for Nuclear Incidents” as EPA 400-R-92-001 in May 1992, which supersedes this citation.

5. **Page 6, Section I.B, FN 4 refers to “Accidental Radioactive Contamination of Human Food and Animal Feeds,” USDHEW, 43 FR 58790, December 15, 1978.**

The Food and Drug Administration, Department of Health and Human Services, issued “Guidance on Accidental Radioactive Contamination of Human Food and Animal Feeds; Recommendations for State and Local Agencies; Availability,” on August 13, 1998 (63 FR 43402), which supersedes this citation.

6. **Page 9, Section I.D, FN 5 refers to Potassium Iodide as a Thyroid-Blocking Agent in a Radiation Emergency, issued by U.S. Department of Health, Education and Welfare, 43 FR 58798, December 15, 1978.**

The Food and Drug Administration (FDA) issued “Potassium Iodide as a Thyroid Blocking Agent in a Radiation Emergency,” on December 11, 2001 (66 FR 238:64046), which supersedes this citation.

7. **Page 14, Section I.D, FN 7 refers to guidance being prepared by an interagency Task Force on Emergency Instrumentation (offsite) for offsite radiation measurement systems, accident assessment techniques, and the type and quantity of instruments needed for the various exposure pathways.**

FEMA issued FEMA-REP-2, Rev. 2, "Guidance on Offsite Emergency Radiation Measurement Systems, Phase 1 Airborne Release," in June 1990.

8. **Pages 27-28, Section 1.1 discusses the development of a National Radiological Emergency Preparedness Plan.**

FEMA issued the Federal Radiological Emergency Response Plan (FRERP) on May 8, 1996 (61 FR 20944).

9. **Page 40, Section II.C.1 refers to a Federal Radiological Monitoring and Assessment Plan, the former Radiological Assistance Plan (RAP), and the Interagency Radiological Assistance Plan (IRAP).**

FEMA issued the Federal Radiological Emergency Response Plan (FRERP) on May 8, 1996 (61 FR 20944), which supersedes these documents.

10. **Page 45, Section II.E.5 refers to the Emergency Broadcast System (EBS).**

The Emergency Broadcast System (EBS) was replaced by the Emergency Alert System (EAS) by a Report and Order that the Federal Communications Commission issued on December 28, 1994 (59 FR 67090).

11. **Page 46, Section II.E.7 refers to the "Respiratory Protective Devices Manual," pages 123-126, issued in 1963 by the American Industrial Hygiene Association, for ad hoc respiratory protection.**

The current Respiratory Protective Devices Manual (2nd edition) and the forthcoming 3rd edition do not contain a similar table for ad hoc respiratory protection; however, according to the American Industrial Hygiene Association, it is still correct to refer to the 1963 manual as the most recent version of the Respiratory Protection Manual that contains the ad hoc respiratory protection table.

12. **Page 52, Sections II.H.1 and II.H.2 refer to NUREG-0696, Revision 1.**

"Revision 1" should be deleted; NUREG-0696 has not been revised.

13. **Page 56, Section II.I.2 refers to NUREG-0578, "TMI-2 Lessons Learned Task Force Status Report and Short-Term Recommendations," July 1979, and the NRC letter to licensees, dated October 30, 1979, on accident assessment and in-plant radiation monitoring.**

NUREG-0737, "Clarification of TMI Action Plan Requirements," November 1980, and Supplement 1 to NUREG-0737, January 1983, supersede these citations.

14. **Page 59, Section II.J, Protective Response Planning Standard.**

On January 19, 2001, the NRC issued a final rule amending this planning standard to insert the following sentence after the first sentence in the planning standard: "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 (KI), as appropriate." (66 FR 5427)

15. **Page 60, Section II.J.7 refers to EPA PAG Manual EPA-52011-75-001.**

EPA issued EPA-400-R-92-001, May 1992, which supersedes this document.

16. **Page 61, Section II.J.9 refers to EPA-52011-75-001 regarding exposure resulting from passage of radioactive airborne plumes and the DHEW (new DHHS), FDA, Federal Register notice of December 15, 1978 (43 FR 58790) regarding radioactive contamination of human food and animal feeds.**

EPA issued EPA-400-R-92-001, May 1992, which supersedes EPA-52011-75-001. The Food and Drug Administration (FDA), Department of Health and Human Services (DHHS), issued "Guidance on Accidental Radioactive Contamination of Human Food and Animal Feeds, Recommendations for State and Local Agencies, Availability," on August 13, 1998 (63 FR 43402).

17. **Page 63, FN 1 refers to the DHEW (new DHHS) Federal Register notice of December 15, 1978, "Potassium Iodide as a Thyroid-Blocking Agent in a Radiation Emergency."**

The Food and Drug Administration (FDA) issued "Potassium Iodide as a Thyroid Blocking Agent in a Radiation Emergency," on December 11, 2001 (66 FR 238:64046), which supersedes this citation.

18. **Page 64, FN 2 refers to 1977 and 1978 documents on protection afforded by sheltering.**

EPA issued EPA 400-R-92-001 in May 1992, which supersedes this citation.

19. **Page 66, Section II.K.1 refers to EPA Emergency Worker and Lifesaving Activity Protective Action Guides in EPA 52011-751001.**

EPA issued EPA 400-R-92-001 in May 1992, which supersedes this citation.

20. **Page 67, Section II.K.6.c refers to Draft ANSI 13.12 for permitting return of areas and items to normal use.**

EPA PAG Manual, EPA 400-R-92-001 (see items 16 and 17), and the Food and Drug Administration, DHHS, "Guidance on Accidental Radioactive Contamination of Human Food and Animal Feeds: Recommendations for State and Local Agencies," dated August 13, 1998 (63 FR 43402) supersede this citation.

21. **Page 70, Section II.M.2 refers to the recovery organization recommended by the Atomic Industrial Forum's "Nuclear Power Plant Emergency Response Plan," dated October 11, 1979.**

"Functional Criteria for Emergency Response Facilities," NUREG-0696, issued on February 1981, and "Clarification of TMI Action Plan Requirements, Requirements for Emergency Response Capability," NUREG-0737, Supplement No. 1, issued January 1983, supersede this citation.

22. **Appendix 1, page 1-3 Basis for Emergency Action Levels for Nuclear Power Facilities, page 1-16, State and Local Offsite Authority Actions, Item No.3, and pages 1-17 to 1-19, Example Initiating Conditions: General Emergency.**

Supplement 3, "Criteria for Protective Action Recommendations for Severe Accidents," Draft Report for Interim Use and Comment to NUREG-0654/FEMA-REP-1, Rev. 1, issued July 1996, supersedes these cited pages.

23. **Appendix 2, page 2-2 refers to "proposed Revision 1 to NRC Regulatory Guide 1.23" for acceptance criteria for meteorological measurements.**

Supplement 1 to NUREG-0737, "Clarification of TMI Action Plan Requirements," January 1983, supersedes this citation.

24. **Appendix 3, page 3-8 refers to "Outdoor Warning Systems Guide," Report No. 4100, by Bolt, Beranek, and Newman, Inc., June 1979 (FEMA publication no. CPG-1-17).**

"Guide for the Evaluation of Alert and Notification Systems for Nuclear Power Plants," FEMA-REP-10, November 1985, supersedes this citation.

25. **Appendix 3, Section C.4.a, page 3-13 refers to the Emergency Broadcast System (EBS).**

The Emergency Broadcast System (EBS) was replaced by the Emergency Alert System (EAS) by a Report and Order of the Federal Communications Commission issued on December 28, 1994 (59 FR 67090).

NRC FORM 335 (2-89) NRCM 1102, 3201, 3202	U.S. NUCLEAR REGULATORY COMMISSION BIBLIOGRAPHIC DATA SHEET <i>(See instructions on the reverse)</i>	1. REPORT NUMBER (Assigned by NRC, Add Vol., Supp., Rev., and Addendum Numbers, If any.) NUREG-0654/FEMA-REP-1, Rev 1, Addenda									
2. TITLE AND SUBTITLE Criteria for Preparation and Evaluation of Radiological Emergency Plans in Support of Nuclear Power Plants Addenda Final Report	3. DATE REPORT PUBLISHED <table border="1"> <tr> <td>MONTH</td> <td>YEAR</td> </tr> <tr> <td>March</td> <td>2002</td> </tr> </table>	MONTH	YEAR	March	2002	4. FIN OR GRANT NUMBER N/A					
MONTH	YEAR										
March	2002										
5. AUTHOR(S) NRC/FEMA Working Group	6. TYPE OF REPORT Technical	7. PERIOD COVERED <i>(Inclusive Dates)</i> N/A									
8. PERFORMING ORGANIZATION - NAME AND ADDRESS <i>(If NRC, provide Division, Office or Region, U.S. Nuclear Regulatory Commission, and mailing address; if contractor, provide name and mailing address.)</i> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;"> Division of Inspection Program Management Office of Nuclear Reactor Regulation U.S. Nuclear Regulatory Commission Washington, DC 20555-0001 </td> <td style="width: 50%;"> Technological Services Division Office of National Preparedness Federal Emergency Management Agency Washington, DC 20472 </td> </tr> </table>			Division of Inspection Program Management Office of Nuclear Reactor Regulation U.S. Nuclear Regulatory Commission Washington, DC 20555-0001	Technological Services Division Office of National Preparedness Federal Emergency Management Agency Washington, DC 20472							
Division of Inspection Program Management Office of Nuclear Reactor Regulation U.S. Nuclear Regulatory Commission Washington, DC 20555-0001	Technological Services Division Office of National Preparedness Federal Emergency Management Agency Washington, DC 20472										
9. SPONSORING ORGANIZATION - NAME AND ADDRESS <i>(If NRC, type "Same as above"; if contractor, provide NRC Division, Office or Region, U.S. Nuclear Regulatory Commission, and mailing address.)</i> Same as above											
10. SUPPLEMENTARY NOTES Edwin F. Fox, Jr., NRC Project Manager											
11. ABSTRACT <i>(200 words or less)</i> NUREG-0654/FEMA-REP-1, Revision 1, was issued in November 1980 and is the basic emergency planning document used by nuclear power plant licensees and State and local governments to develop and maintain radiological emergency plans for nuclear power plants. NRC and FEMA staff use NUREG-0654/FEMA-REP-1, Revision 1, to review licensee and State and local emergency plans, respectively, and to make findings and determinations regarding the adequacy of these plans. Many of the references in NUREG-0654/FEMA-REP-1, Revision 1, are no longer current, however, and have been updated or superceded. Therefore, in an effort to enhance the usefulness of the document, the NRC and FEMA are issuing addenda to update the references in NUREG-0654/FEMA-REP-1, Revision 1.											
12. KEY WORDS/DESCRIPTORS <i>(List words or phrases that will assist researchers in locating the report.)</i> emergency plans emergency planning emergency preparedness radiological emergency planning radiological emergency response plans emergency planning references	<table border="1"> <tr> <td>13. AVAILABILITY STATEMENT</td> </tr> <tr> <td style="text-align: center;">unlimited</td> </tr> <tr> <td>14. SECURITY CLASSIFICATION</td> </tr> <tr> <td><i>(This Page)</i></td> </tr> <tr> <td style="text-align: center;">unclassified</td> </tr> <tr> <td><i>(This Report)</i></td> </tr> <tr> <td style="text-align: center;">unclassified</td> </tr> <tr> <td>15. NUMBER OF PAGES</td> </tr> <tr> <td>16. PRICE</td> </tr> </table>		13. AVAILABILITY STATEMENT	unlimited	14. SECURITY CLASSIFICATION	<i>(This Page)</i>	unclassified	<i>(This Report)</i>	unclassified	15. NUMBER OF PAGES	16. PRICE
13. AVAILABILITY STATEMENT											
unlimited											
14. SECURITY CLASSIFICATION											
<i>(This Page)</i>											
unclassified											
<i>(This Report)</i>											
unclassified											
15. NUMBER OF PAGES											
16. PRICE											



Federal Recycling Program

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, DC 20555-0001

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, \$300