

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION  
WASHINGTON, D.C. 20555-0001

June 12, 1997

NRC INFORMATION NOTICE 97-34: DEFICIENCIES IN LICENSEE SUBMITTALS  
REGARDING TERMINOLOGY FOR  
RADIOLOGICAL EMERGENCY ACTION LEVELS  
IN ACCORDANCE WITH THE NEW PART 20

Addressees

All holders of operating licenses or construction permits for test and research reactors.

Purpose

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice to inform addressees of the issuance of a revised Appendix I to NUREG-0849, "Standard Review Plan for the Review and Evaluation of Emergency Plans for Research and Test Reactors." This revised appendix provides guidance on incorporating the new 10 CFR Part 20 regulations into the radiological emergency action levels (EALs). It is expected that recipients will review the information for applicability to their facilities and consider actions, as appropriate. However, suggestions contained in this information notice are not NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances

Part 20 was revised and the final rule was published in the *Federal Register* on May 21, 1991 (56 FR 23360), with an original implementation date of January 1, 1993. Subsequently, the implementation date was extended to January 1, 1994 (57 FR 38588). In response to these regulations, many licensees of test and research reactors have submitted to the NRC revised emergency plans that were intended to incorporate or reflect the terminology introduced in the new regulations. Title 10 of the Code of Federal Regulations, Part 20 is referenced in the section of the emergency plan involving radiological EALs.

During its review of these submittals, the NRC staff noted that many licensees incorrectly converted the wording of the EALs from the old terminology found in NUREG-0849. As an example, (1) some licensees inappropriately converted "maximum permissible concentrations" (MPCs) to "effluent concentrations" (ECs) and (2) some inaccurately used the term "deep dose equivalent." Several licensees merely substituted the EC term for the MPC term. Other licensees used various multipliers in an attempt to correct the differences between the two values. Still other licensees replaced the MPC term with "derived air concentration." These submittals indicate the need for additional guidance that could be used to assist in updating EALs.

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updated on  
7/8/97

PDR I+E NOTICE 97-034  
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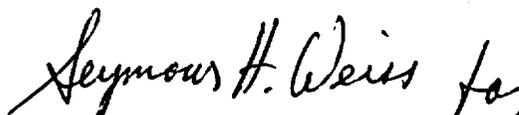
Discussion

If the errors in the revised EAL schemes are left uncorrected, they could potentially result in a licensee taking some conservative actions that are unwarranted or in the licensee delaying appropriate actions.

Guidance in the form of a revision to Appendix I to NUREG-0849 was issued in April 1997. The revised appendix provides guidance on incorporating the current 10 CFR Part 20 regulations into the radiological EALs and, at the same time, corrects some omissions in prior guidance and clarifies some other EALs for the implementation of the new Part 20 regulations. Attachment 1 to this document is a copy of the revised Appendix I. NUREG-0849, which was published in 1983, is available from the following sources:

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This information notice requires no specific action or written response. If you have any questions about the information in this notice, please contact the technical contact listed below or the appropriate regional office.

  
Marylee M. Slosson, Acting Director  
Division of Reactor Program Management  
Office of Nuclear Reactor Regulation

Technical contact: Lawrence K. Cohen  
301-415-2923  
E-mail: lkc@nrc.gov

Attachments:

1. Revised Appendix I of NUREG-0849
2. List of Recently Issued NRC information Notices

*Attachment foled in Jacket.*

APPENDIX I  
 EMERGENCY CLASSES

ACTION LEVEL*	PURPOSE
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**Notification of Unusual Events (NOUE)**

Actual or projected radiological effluent<sup>†</sup> at the site boundary which is calculated (or measured) to result in either of the following conditions, both of which are based on an exposure of 24 hours or less:

- (1) A deep dose equivalent of 0.15 milliSievert (mSv) [15 mrem]
- OR
- (2) A committed effective dose equivalent of 0.15 mSv [15 mrem] based on the following considerations:
  - $100 \text{ EC} \times 24 \text{ hr}^{**} = 2.4 \times 10^3 \text{ EC-hr} \approx 0.15 \text{ mSv [15 mrem]}$  (for radionuclides other than noble gases)
  - $50 \text{ EC} \times 24 \text{ hr}^{**} = 1.2 \times 10^3 \text{ EC-hr} \approx 0.15 \text{ mSv [15 mrem]}$  (for noble gases)<sup>†</sup>

- Ensure that the first step in any response later found to be necessary has been carried out.
- Bring the operating staff to a state of readiness.
- Provide systematic handling of unusual events information and decisionmaking.

Report or observation of a severe natural phenomenon affecting the reactor site

Receipt of bomb threat affecting the reactor facility

Fire within the reactor facility not extinguished within 15 minutes

**Alert**

Actual or projected radiological effluent<sup>†</sup> at the site boundary which is calculated (or measured) to result in either of the following conditions, both of which are based on an exposure of 24 hours or less:

- (1) A deep dose equivalent of 0.75 mSv [75mrem]
- OR
- (2) A committed effective dose equivalent of 0.75 mSv [75 mrem] based on the following considerations:
  - $500 \text{ EC} \times 24 \text{ hr}^{**} = 1.2 \times 10^4 \text{ EC-hr} \approx 0.75 \text{ mSv [75 mrem]}$  (for radionuclides other than noble gases)
  - $250 \text{ EC} \times 24 \text{ hr}^{**} = 6 \times 10^3 \text{ EC-hr} \approx 0.75 \text{ mSv [75 mrem]}$  (for noble gases)<sup>††</sup>

- Ensure that emergency personnel are readily available to respond if the situation becomes more serious or to perform confirmatory radiation monitoring if required.
- Provide current offsite authorities with status information.

Actual or projected radiation levels<sup>†</sup> at the site boundary of 0.2 mSv/hr deep dose equivalent [20 mrem/hr] for 1 hour or 1.0 mSv [100 mrem] to the thyroid (committed dose equivalent)

## APPENDIX I (cont'd)

ACTION LEVEL*	PURPOSE
<p><b><u>Site Area Emergency</u></b></p> <p>Actual or projected radiological effluent<sup>†</sup> at the site boundary which is calculated (or measured) to result in either of the following conditions, both of which are based on an exposure of 24 hours or less:</p> <p>(1) A deep dose equivalent of 3.75 mSv [375 mrem]</p> <p style="text-align: center;">OR</p> <p>(2) A committed effective dose equivalent of 3.75 mSv [375 mrem] based on the following considerations:</p> <ul style="list-style-type: none"><li>• 2500 EC x 24 hr** = <math>6 \times 10^4</math> EC-hr <math>\approx</math> 3.75 mSv [375 mrem] (for radionuclides other than noble gases)</li><li>• 1250 EC x 24 hr** = <math>3 \times 10^4</math> EC-hr <math>\approx</math> 3.75 mSv [375 mrem](for noble gases)<sup>††</sup></li></ul>	<ul style="list-style-type: none"><li>• Ensure that response centers are manned.</li><li>• Ensure that monitoring teams are dispatched.</li><li>• Ensure that personnel required for evacuation of onsite areas are at duty stations.</li><li>• Provide consultation with offsite authorities.</li><li>• Provide information for the public through offsite authorities.</li></ul>
<p>Actual or projected radiation levels<sup>†</sup> at the site boundary of 1.0 mSv/hr [100 mrem/hr] deep dose equivalent for 1 hour or 5.0 mSv [500 mrem] to the thyroid (committed dose equivalent)</p>	
<p><b><u>General Emergency</u></b></p> <p>Sustained actual or projected radiation levels<sup>†</sup> at the site boundary of 5.0 mSv/hr [500 mrem/hr] deep dose equivalent</p> <p>Actual or projected dose<sup>†</sup> at the site boundary in the plume exposure pathway of 10 mSv [1 rem] (total effective dose equivalent) or 50 mSv [5 rem] to the thyroid (committed dose equivalent)</p>	<ul style="list-style-type: none"><li>• Initiate predetermined protective actions for the public.</li><li>• Provide continuous assessment of information from licensee and offsite organization measurements.</li><li>• Initiate additional measures as indicated by actual or potential releases.</li><li>• Provide consultation with offsite authorities.</li><li>• Provide updates for the public through offsite authorities.</li></ul>

\* The situation that may lead to an emergency class described in the subsections of Section 4.0 may be referenced as emergency action levels appropriate to the emergency class.

<sup>†</sup> It is expected that licensees will determine the relationship of the EAL dose levels at the site boundary to instrumentation readings and/or safety analyses accident conditions for their specific facilities.

\*\* Effluent concentration (EC) as listed in Title 10 of the *Code of Federal Regulations*, Part 20 (10 CFR Part 20), "Standards for the Protection Against Radiation," Appendix B, Table 2. If the exposure time is less than 24 hours, the EC multiplier can be increased proportionately, provided that the values of  $2.4 \times 10^3$  and  $1.2 \times 10^3$  EC-hr are used to declare a NOUE; the proportional increase for an alert is 5 and for a site area emergency it is 25.

†† Table 2 of Appendix B to 10 CFR Part 20 lists the concentration values that are equivalent to the radionuclide concentrations which, if inhaled or ingested continuously over the course of a year, would produce a total effective dose equivalent of 0.5 mSv [50 mrem]. However, for noble gases where the submersion (external dose) is limiting, the concentration values would produce a total effective dose equivalent of 1 mSv [100 mrem].

LIST OF RECENTLY ISSUED  
NRC INFORMATION NOTICES

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Information Notice No.	Subject	Date of Issuance	Issued to
97-33	Unanticipated Effect of Ventilation System on Tank Level Indications and Engineering Safety Features Actuation System Setpoint	06/11/97	All holders of OLs or CPs for nuclear power reactors
95-36, Supp. 1	Potential Problems with Post-Fire Emergency Lighting	06/10/97	All holders of OLs or CPs for nuclear power reactors
97-32	Defective Worm Shaft Clutch Gears in Limitorque Motor-Operated Valve Actuators	06/10/97	All holders of OLs or CPs for nuclear power reactors
97-31	Failures of Reactor Coolant Pump Thermal Barriers and Check Valves in Foreign Plants	06/03/97	All holders of OLs or CPs for pressurized-water reactor plants
97-30	Control of Licensed Material During Reorganizations, Employee-Management Disagreements, and Financial Crises	06/03/97	All material and fuel cycle licensees
97-29	Containment Inspection Rule	05/30/97	All holders of OLs or CPs for nuclear power reactors

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OL = Operating License  
CP = Construction Permit

Discussion

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original signed by S.H. Weiss for  
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Office of Nuclear Reactor Regulation

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DATE	05/20/97	05/22/97	05/30/97	06/10/97 <i>JS</i>

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*JKD  
5/26*

*RFS  
5/28*

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