

UNIT ONE

REGULATIONS AND GUIDES FOR RADIATION PROTECTION AND RESPONSE

This unit introduces the major radiation protection regulations, standards, laws and guidance that apply to radiological emergency response. These regulations and guides are produced by two groups.



- Regulatory groups with radiation protection responsibilities are agencies or departments of government, charged with developing and enforcing regulations. The Environmental Protection Agency, the Nuclear Regulatory Commission and the Department of Transportation are examples of regulatory groups.
- *Advisory* groups with radiation protection responsibilities are generally made up of national and international experts in biology, medicine, genetics, health physics, and other related scientific disciplines. The National Council on Radiation Protection (NCRP) is an example of an advisory group.
 - They publish specific recommendations on radiation protection matters.
 - Their recommendations have been widely adopted and form the basis for radiation protection standards throughout the world.

In radiological emergency response operations, you need to know, or know where to find, the standards for radiation protection, the recommended methods for radiation protection, and the regulations being followed by licensees and carriers of radioactive materials. By completing the programmed instruction in this unit, you will develop a base level of knowledge about the contents and purpose of several important documents.



GATE FRAME QUESTION



Based upon your knowledge of and experience with standards and guides on radiation protection and response, differentiate between and provide examples of regulations, standards, and regulatory guides related to radiological protection or response.



ANSWER

Your answer should include the adjacent information.

Regulations are published by Federal agencies and have the effect of law. An example of a regulation is 10 CFR 20, *Standards for Protection Against Radiation*.

Standards are criteria established by radiation authorities as a rule for the measure of quality programs. An example of a standard is the *Standard for Professional Competence of Responders to Hazardous Materials Incidents*.

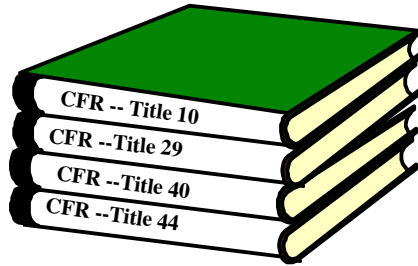
Regulatory guides provide the methodology for carrying out the requirements of a regulation. An example of a regulatory guide is NUREG-0654, FEMA REP-1, *Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants*.

If your answer included all or most of the above points, you should be ready for the Summary Questions at the end of this unit. Turn to page 1-16.

If your answer did not include these points, it would be advisable for you to complete the programmed instruction for this unit. Turn to page 1-4.



CODE OF FEDERAL REGULATIONS



Regulations have the effect of law. Proposed regulations, final regulations, and notices about regulations are published in a daily government publication called the *Federal Register*. Final regulations published in the *Federal Register* become part of the *Code of Federal Regulations (CFR)*.

The *CFR* is the legal basis for administering any given program. For example, it sets permissible exposure limits for occupationally exposed radiation workers, defines criteria for licensees of radioactive material, and defines for nuclear reactor utilities their responsibilities relating to public welfare.

The *CFR* is divided into 50 *Titles*. Each Title is divided into *Chapters*, and each Chapter is divided into *Parts*. For example, Title 10, Energy, includes regulations of the Nuclear Regulatory Commission (NRC). CFR references are usually denoted by the title (e.g. 10) CFR and the part (e.g. 20). Part 20 of Title 10 sets out the general NRC requirements for radiation protection applicable to all NRC licensees. The NRC's *Occupational Limits for External Exposure* are included in this part of the CFR.

Another important title to remember is Title 29, which includes the OSHA regulation, *Hazardous Waste Operations and Emergency Response* (29 CFR 17).

Title 40 includes the Environmental Protection Agency's (EPA) regulations on radiation protection.

Title 44 includes the radiation planning and protection responsibilities of the Federal Emergency Management Agency (FEMA). 44 CFR 351 assigns to FEMA Federal agency responsibility for assisting State and local government in radiological emergency planning and preparedness activities.

Title 49 covers the U.S. Department of Transportation (USDOT) regulations, including transportation of radioactive materials (49 CFR Parts 171-178).



QUESTION

If someone asked you where in the Code of Federal Regulations to find occupational limits for whole body exposure to radiation, where would you direct him?

Circle the correct answer.

- a. Title 40.
- b. Title 10.

Turn the page to check your answer.



ANSWERS

- a. No. These limits are not located in the EPA regulations.

Review page 1-4 and try the next question.

- b. Right. Title 10 includes the NRC's limits for radiation exposure.

Proceed to the next section.

QUESTION

Circle the correct answer.

If you wanted to know the regulations for hazardous waste and emergency response operations, you would refer to

- a. 10 CFR 20.
b. 29 CFR 17.

Turn the page to check your answer.



ANSWERS

- a. No. 10 CFR 20 covers limits for protection against radiation.

Review page 1-4 before you move on.

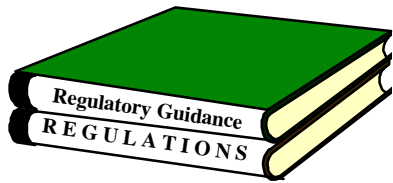
- b. That's right. Regulations related to emergency response operations for releases of hazardous substances are included in 29 CFR 17.

Go on to page 1-8.



REGULATORY GUIDES AND GUIDANCE DOCUMENTS

The *Code of Federal Regulations* does not always provide the methodology for carrying out the requirements of its regulations. The section of the *CFR* you reference may cite a regulatory guide for doing so. While regulatory guides are not the law, if referenced in a *CFR* as the way to do something, they then carry the force of the law.



NUREG-0654 FEMA REP-1, *Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants*, is an example of such a regulatory guide. Intended for use by NRC licensees and operators of commercial nuclear power reactors and by State and local governments, it is concerned with accidents at fixed commercial nuclear power reactors that might have an impact on public health and safety. It contains 16 planning standards and evaluation criteria, many of which affect the role of the radiological emergency responder.

Other guidance published by the Federal government does not represent a Federal regulatory requirement. Its use by organizations and governments is voluntary. An example of such a guidance document with relevance to radiological emergency response is FEMA-REP-5, *Guidance for Developing State, Tribal, and Local Radiological Emergency Response Planning and Preparedness for Transportation Accidents*. It is intended for use by Federal, State, Tribal, and local officials responsible for radiological emergency planning and preparedness for transportation accidents. It provides information to use in developing and enhancing emergency capabilities for responding to transportation accidents involving radioactive materials. Its 14 planning objectives cover all aspects of preparedness including post-accident operations.

Under a set of regulations governing radiological emergency planning and preparedness published by the



Federal Emergency Management Agency in March 1982 (47 CFR 10758), the Environmental Protection Agency (EPA) was given the responsibility for establishing Protective Action Guides (PAGs) and preparing guidance for implementing the PAGs. The resulting document, EPA 400-R-92-001, *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents*, presents these guides for specific exposure pathways and associated time periods and guidance for the implementation of the PAGs. A detailed discussion of the PAGs is included in Unit Five of this course.

The *1996 North American Emergency Response Guidebook*, published by the USDOT, Transport Canada, and the Mexican Secretariat of Transport and Communications, provides basic information for first responders on hazardous materials, including radioactive material.

To check your comprehension of these points, complete the following question.

QUESTION

Circle the correct answer.

If you are looking for information on enhancing your emergency plans for responding to transportation accidents involving radioactive materials, you would refer to

- a. FEMA-REP-5.
- b. FEMA-REP-1.

Turn the page to check your answer.



ANSWERS

- a. That's correct. FEMA REP-5 is *Guidance for Developing State, Tribal, and Local Radiological Emergency Response Planning and Preparedness for Transportation Accidents*.

Turn to page 1-12.

- b. No. FEMA-REP-1, also referred to as NUREG-0654, deals with preparedness and plans for nuclear power plant incidents.

Review page 1-8 and try the next question.

QUESTION

Circle the correct answer.

At a radiation accident scene, if you are asked whether the projected release of radioactive material will result in implementation of PAGs, where will you go for information about the PAGs?

- a. *Code of Federal Regulations.*
- b. EPA-400-92-R-001.

Turn the page to check your answer.



ANSWERS

- a. You will not find the information you need in the *Code of Federal Regulations* because the PAGs are guidance, not a regulation.

Review page 1-8 before continuing on to the next section.

- b. That's right. You are familiar with the purpose and content of *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents*.

Go on to page 1-12.



STANDARDS PUBLISHED BY ADVISORY GROUPS

As mentioned earlier, advisory groups provide recommendations for radiation protection and standards. Standards are criteria established by radiation authorities as a rule for the measure of quality programs. The publications of these organizations can provide useful references for the radiological emergency responder who wishes to learn more about radiation protection and emergency response.



The *International Commission on Radiological Protection (ICRP)* was the first international body concerned with radiation protection standards. ICRP reports often provide the basis for Federal regulation and guidelines. The following ICRP reports have relevance to radiological emergency response:

- ICRP 17: *Protection of the Patient in Radionuclide Investigations.*
- ICRP 26: *Radiological Protection.*
- ICRP 28: *Principals and General Procedures for Handling Emergency And Accidental Exposure Of Workers.*
- ICRP 39: *Principals for Limiting Exposure Of The Public To Natural Sources Of Radiation.*
- ICRP 40: *Protection of the Public In Major Radiation Accidents.*

The National Council on Radiation Protection and Measurements (NCRP) collects, develops, analyzes, and disseminates information about protection against radiation and radiation measurements, quantities and units. The NCRP works closely with the ICRP.

- NCRP 39, *Basic Radiation Protection Criteria*, provides basic information on radiation exposure types and biological effects and outlines various radiation protection standards.



- NCRP 42: *Radiological Factors Affecting Decision Making in a Nuclear Attack* describes effects of nuclear detonations and high level radiation exposure.

The American National Standards Institute (ANSI) and the National Institute of Occupational Safety and Health (NIOSH) are two more advisory organizations that have made a contribution to the radiation protection and preparedness fields through the establishment of standards or the development of suggested means of carrying out standards. In conjunction with the National Fire Protection Association (NFPA), ANSI has published a *Standard for Professional Competence of Responders to Hazardous Materials Incidents, ANSI/NFPA 472*. This standard applies to response to radiological materials incidents.

To check your understanding of these concepts, answer the following question.

QUESTION

Circle the correct answer.

Advisory groups in radiation protection and response publish standards that

- a. have the force of law.
- b. are intended to provide standards and procedures that may be, but are not required to be, adopted by affected organizations.

Turn the page to check your answer.



ANSWERS

- a. No. Advisory groups are not associated with the government, and their findings and recommendations are not legally binding.

Complete the next question.

- b. That's correct. Advisory groups can provide useful references for the radiological emergency responder who wishes to learn more about radiation protection and response.

Turn to page 1-16.

QUESTION

A reference for developing radiological emergency response operations competencies is

Circle the correct answer.

- a. NCRP 39, *Basic Radiation Protection Criteria*.
- b. ANSI/NFPA 472, *Standard for Professional Competence of Responders to Hazardous Materials Incidents*.

Turn the page to check your answer.



ANSWERS

- a. NCRP 39 is focused on radiation protection principles rather than operational standards.

Review page 1-12 before proceeding to the Summary Questions.

- b. That's right. ANSI/NFPA 472 specifies minimum competencies for those who will respond to hazardous (including radioactive) materials incidents.

You are now ready for the Summary Questions on page 1-16.



SUMMARY QUESTIONS

QUESTION

An example of a regulatory guide referenced in the *Code of Federal Regulations* is

Circle the correct answer.

- a. NUREG 0654/FEMA-REP-1.
- b. FEMA-REP-5.

Turn the page to check your answer.



ANSWERS

- a. That is correct. NUREG 0654 is authorized by 10 CFR 20.

Move on to the next Summary Question.

- b. No, this document is used by affected organizations and governments on a voluntary basis.

Go back and review this unit.

QUESTION

Circle the correct answer.

An example of guidance published by an advisory group is

- a. *Guidance for Developing State, Tribal, and Local Radiological Emergency Response Planning and Preparedness for Transportation Accidents.*
- b. *Basic Radiation Protection Criteria.*

Turn the page to check your answer.



ANSWERS

- a. No. This guidance document is published by the Federal Emergency Management Agency.

Review this unit before moving to Unit Two.

- b. Right. This guidance is published by the NCRP.

You are now ready to turn to Unit Two on page 2-1.

