

REGULATORY GUIDE

OFFICE OF STANDARDS DEVELOPMENT

REGULATORY GUIDE 8.10

OPERATING PHILOSOPHY FOR MAINTAINING OCCUPATIONAL RADIATION EXPOSURES AS LOW AS IS REASONABLY ACHIEVABLE

A. INTRODUCTION

Paragraph 20.1(c) of 10 CFR Part 20, "Standards for Protection Against Radiation," states, in part, that licensees should make every reasonable effort to maintain radiation exposures as far below the limits specified in that part as practicable. This guide describes to licensees a general operating philosophy acceptable to the NRC staff as a necessary basis for a program of maintaining occupational exposures to radiation as low as is reasonably achievable.

Both this guide and Regulatory Guide 8.8, "Information Relevant to Maintaining Occupational Radiation Exposure as Low as is Reasonably Achievable (Nuclear Power Reactors)," deal with the concept of "as low as is reasonably achievable" occupational exposures to radiation. The main difference between the two guides, aside from the fact that Regulatory Guide 8.8 applies only to nuclear power reactors and this guide applies to all specific licensees, is that Regulatory Guide 8.8 is addressed to applicants for a license and tells them what information relevant to "as low as is reasonably achievable" should be included in their license applications. This guide, on the other hand, describes an operating philosophy that the NRC staff believes all specific licensees should follow to keep occupational exposures to radiation as low as is reasonably achievable.

B. DISCUSSION

Even though current occupational exposure limits provide a very low risk of injury, it is prudent to avoid unnecessary exposure to radiation. The objective is thus to reduce occupational exposures as far below the specified limits as is reasonably achievable by means of good radiation protection planning and practice, as well as by management commitment to policies that foster vigilance against departures from good practice.

In addition to maintaining doses to individuals as far below the limits as is reasonably achievable, the sum of the doses received by all exposed individuals should also be maintained at the lowest practicable level. It would not be desirable, for example, to hold the highest doses to individuals to some fraction of the applicable limit if this involved exposing additional people and significantly increasing the sum of radiation doses received by all involved individuals.

C. REGULATORY POSITION

Two basic conditions are considered necessary in any program for keeping occupational exposures as far below the specified limits as is reasonably achievable. The management of the licensed facility should be committed to maintaining exposures as low as is reasonably achievable, and the personnel responsible for radiation protection should be continually vigilant for means to reduce exposures.

1. Management Commitment

The commitment made by licensee management to minimize exposures should provide clearly defined radiation protection responsibilities and an environment in which the radiation protection staff can do its job properly. There are several aspects to this commitment:

a. **Plant personnel should be made aware of management's commitment to keep occupational exposures as low as is reasonably achievable.** The commitment should appear in policy statements, instructions to personnel, and similar documents. As a minimum, workers should be sufficiently familiar with this commitment that they can explain what the management commitment is, what "as low as is reasonably achievable exposure to radiation" means, why it is recommended, and how they have been advised to implement it on their jobs.

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Comments and suggestions for improvements in these guides are encouraged at all times, and guides will be revised, as appropriate, to accommodate comments and to reflect new information or experience. However, comments on this guide, if received within about two months after its issuance, will be particularly useful in evaluating the need for an early revision.

Comments should be sent to the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention Docketing and Service Section.

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b. **Management should periodically perform a formal audit to determine how exposures might be lowered.** This should include reviews of operating procedures and past exposure records, plant inspections, and consultations with the radiation protection staff or outside consultants. As a minimum, management should be able to discuss which operating procedures were reviewed, in which locations most exposures are being received, what groups of workers are receiving the highest exposures, what discussions they have had with the radiation protection staff or outside consultants, and what steps they have taken to reduce exposures.

c. **The management should ensure that there is a well-supervised radiation protection capability with well-defined responsibilities.** The qualifications for the Radiation Protection Manager for a nuclear power reactor facility are presented in Regulatory Guides 1.8 and 8.8. Applicants submitting applications for any specific license other than a nuclear power reactor license should select and state the qualifications for the lead individual who will be responsible for implementing the radiation protection program for the facility, i.e., the Radiation Safety Officer (RSO).¹ The qualifications selected should be commensurate with the potential problems anticipated to be encountered in a facility of the type subject to the license.

d. **The management should see that plant workers receive sufficient training.** Section 19.12 of 10 CFR Part 19 requires instruction of personnel on radiation protection. The radiation worker should understand how radiation protection relates to his job and should be tested on this understanding at least once per year. He should have frequent opportunities to discuss radiation safety with the radiation protection staff whenever the need arises. Management should be committed to a review of radiation protection at least once every three years. Training should be sufficient to ensure that the workers can correctly answer questions on radiation protection as it relates to their jobs.

e. **The RSO should be given sufficient authority to enforce safe plant operation.** The RSO should have the authority to prevent unsafe practices and to communicate promptly with an appropriate level of management about halting an operation he deems unsafe. Operating procedures related to radiation safety should be reviewed and approved by radiation protection personnel. This authority should be demonstrable by written policy statements.

f. **Modifications to operating and maintenance procedures and to plant equipment and facilities should be made where they will substantially reduce exposures at a reasonable cost.** The management should be able to

demonstrate that improvements have been *sought*, that modifications have been considered, and that they have been implemented where practicable. Where modifications have been considered but not implemented, the licensee should be prepared to describe the reasons for not implementing them.

2. **Vigilance by the RSO and the Radiation Protection Staff**

It should be the responsibility of the RSO and the radiation protection staff to conduct surveillance programs and investigations to ensure that occupational exposures are as far below the specified limits as is reasonably achievable. Additionally, they should be vigilant in searching out new and better ways to perform all radiation jobs with less exposure. There are several aspects to this responsibility.

a. **The RSO and the radiation protection staff should know the origins of radiation exposures in the plant.** They should know these by location, operation, and job category and should be aware of trends in exposures. Where radiation work permits are used, exposures received should be recorded on the permits. The RSO and the radiation protection staff should be able to describe which locations, operations, and jobs are associated with the highest exposures and why exposures are increasing or decreasing.

b. **The RSO and the radiation protection staff should look for ways to reduce exposures.** When unusual exposures have occurred, the radiation protection staff should direct and participate in an investigation of the circumstances of such exposures to determine the causes and take steps to reduce the likelihood of similar future occurrences. For each such occurrence, the RSO should be able to demonstrate that such an investigation has been carried out, that conclusions were reached as a result of the investigation, and that corrective action was taken, as appropriate.

The RSO and the radiation protection staff should periodically review operating procedures that may affect radiation safety and survey plant operations to identify situations in which exposures can be reduced. Indicated changes should be promptly implemented. Procedures for receiving and evaluating suggestions relating to radiation protection from employees should be established. Workers should be knowledgeable of the procedures for making suggestions on radiation protection.

c. **Adequate equipment and supplies for radiation protection work should be provided.** The RSO should be responsible for ensuring that proper equipment and supplies are available, are maintained in good working order, and are used properly. Written procedures for the use of the equipment should be available and followed.

*Lines indicate substantive changes from previous issue.

¹The term "Radiation Safety Officer" is used by many licensees; other terms are equally acceptable.

D. IMPLEMENTATION

The purpose of this section is to provide information to applicants and licensees regarding the NRC staff's plans for utilizing this regulatory guide.

Except in those cases in which the applicant or licensee proposes an alternative method for complying

with the specified portions of the Commission's regulations, the methods described herein will be used in the evaluation of submittals in connection with applications for a specific license.

Regulatory Guides 1.8 and 8.8 address nuclear power reactor facilities specifically and will be used by the NRC staff in evaluating submittals in connection with licensing actions for nuclear power reactors.