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REGULATORY GUIDE

DIRECTORATE OF REGULATORY STANDARDS

REGULATORY GUIDE 8.10

OPERATING PHILOSOPHY FOR MAINTAINING OCCUPATIONAL RADIATION EXPOSURES AS LOW AS PRACTICABLE

A. INTRODUCTION

Paragraph 20.1(c) of 10 CFR Part 20 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 AEC Regulatory staff as a necessary basis for a program of maintaining occupational exposures to radiation as low as practicable.

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

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 practicable 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 practicable, 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 practicable. The management of the licensed facility should be committed to maintaining exposures as low as practicable, 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 practicable. 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 practicable exposure to radiation" means, why it is recommended, and how they have been advised to implement it on their jobs.

b. Management should periodically perform a formal audit to determine how exposures might be

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lowered. This should include reviews of operating procedures and past exposure records, plant inspections, and consultations with the radiation protection staff and/or outside consultants. As a minimum, management should be able to explain which operating procedures were reviewed, locations where 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 organization with well-defined responsibilities. The individual responsible for the conduct of the radiation protection program should have a bachelor's degree in a science or engineering subject or its equivalent and at least six years of responsible professional experience in health physics, of which at least three should have been in applied radiation protection work, specifically including experience in dealing with the kinds of radiation protection problems likely to arise in the particular operations¹ or have ready access to an individual with such qualifications. (A master's degree may be considered equivalent to a year of experience and a doctor's degree, to two years.) He should be assigned the responsibility for implementing the "as low as practicable" policy and making it a formal part of the radiation protection program. He should be directly responsible to someone at a high management level.

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 no less than annually. 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 that the workers can correctly answer questions on radiation protection as it relates to their jobs.

e. Radiation protection workers should be given sufficient authority to enforce safe plant operation. A radiation protection supervisor 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.

¹ These qualifications supersede the qualifications for similar personnel given in Regulatory Guide 1.8 (Safety Guide 8), which endorsed the American National Standard N18.1-1970.

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 Radiation Protection Staff

It should be the responsibility of the radiation protection staff to conduct surveillance programs and investigations to assure that occupational exposures are as far below the specified limits as practicable. 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 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 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 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 radiation protection supervisor 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 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 radiation protection staff 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.