

The Administrative Procedure Act requires the publication of substantive policy statement currently in use, including its full text, if practicable. (A.R.S. § 41-1091.01). Substantive policy statements are written expressions which inform the general public of an agency's current approach to rule or regulation practice. This substantive policy statement is advisory only. A substantive policy statement does not include internal procedural documents that only affect the internal procedures of the agency and does not impose additional requirements or penalties on regulated parties or include confidential information or rules made in accordance with the Arizona administrative procedure act. If you believe that this substantive policy statement does impose additional requirements or penalties on regulated parties you may petition the agency under section 41-1033, Arizona Revised Statutes, for a review of the statement.

NOTICE OF SUBSTANTIVE POLICY STATEMENT

ARIZONA RADIATION REGULATORY AGENCY

[ARRA-REG-6.1]

1. Subject of the substantive policy statement and the substantive policy statement number by which the policy statement is referenced:

Investigation of Excessive Exposures in X-ray Departments

2. Date the substantive policy statement was issued and the effective date of the policy statement if different from the issuance date:

Effective August 1993

3. Summary of the contents of the substantive policy statement:

Establishes a model program for investigating overexposures in x-ray departments.

4. A statement as to whether the substantive policy is a new statement or a revision:

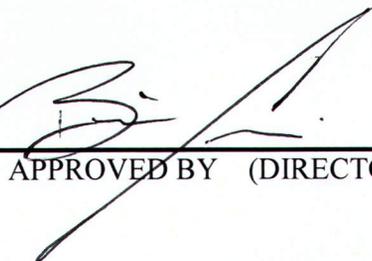
This is a current policy statement.

5. The agency contact person who can answer questions about this substantive policy statement:

Name: Joshua Hoeh, Program Manager, X-ray/Nonionizing

Address: Arizona Radiation Regulatory Agency
4814 South 40th Street
Phoenix, AZ 85040

Telephone: (602) 255-4833



APPROVED BY (DIRECTOR)

11/30/16

DATE

Policy Number: ARRA-REG-6.1
Effective Date: August 1993

Subject Title: Investigation of Excessive Exposures in X-ray Departments

A. INTRODUCTION

R12-1-444 requires the investigation and reporting of overexposures to workers or to an individual of the general public ionizing radiation. This requirement does not include patients receiving radiation for treatment or diagnosis. It is management's responsibility to ensure that these reports and investigations are properly completed. Further, it is the responsibility of each individual working with ionizing radiation, to ensure the proper monitoring by any individual monitoring provided by management. The improper or fraudulent use of such equipment is a violation of R12-1-418 D. and may compromise other legal rights of the individual.

The limits of permissible exposure are found in R12-1-408, R12-1-414, R12-1-415, and R12-1-416. Further, R12-1-407B. requires occupational and public exposures to the extent practicable, be kept as low as reasonably achievable. As a practical matter this means that management is periodically assessing the work conditions to ensure that all are utilizing radiation dose limiting techniques consistent with the tasks being performed. This guide is prepared to assist in the investigation of overexposures as may be reported in x-ray departments. The Agency believes that with the proper investigation, management can take proper action to reduce the likelihood of another overexposure. As a practical matter, x-ray departments generally discover their overexposures when they review their individual monitoring system reports of their monitoring system company directly contact management to advise them of an overexposure. This guide is to assist in the systematic investigation, correction, and reporting of overexposures. Any information collection activities mentioned in this guide are contained in Articles 4 or 10 which provide the regulatory basis for this guide.

B. DISCUSSION

Article 4, "Standards for Protection Against Radiation," requires licensee and registrants to provide monitoring for all occupationally exposed individuals who might receive a dose in excess of 10% of any applicable limit. For additional information and guidance on monitoring, please refer to Regulatory Guide 8.34, "Monitoring Criteria and Methods to Calculate Occupational Doses." Additional information on record keeping requirements is contained in Regulatory Guide 8.7, "Occupational Radiation Exposure Records System. "

C. REGULATORY POSITION

1. Defining an Overexposure

Any exposure to an occupationally exposed individual in excess of the annual limit is an overexposure. Planned Special Exposures are not considered in making this determination. For deep-dose equivalent this annual limit is 0.05 Sv (5 rems). To determine the deep-dose equivalent when wearing two individual monitoring devices, please refer to Regulatory Guide

8.34. The individual may receive all of the annual limit on the last day of the year. Then the same individual may receive all of the annual limit the first day of the next year and not have an overexposure. However, if at any time during a year, the total effective dose equivalent for the year exceeds the limit an overexposure has occurred and must be reported. Please note that this is for all occupational exposure to radiation. If the individual is working at more than one facility, each facility will have to attempt to obtain the exposure information necessary to have that individual's total effective dose equivalent.

1.1 Administrative Limits

Many facilities establish a limit the initiate investigations and work reviews that are well below any regulatory limit. The use of such limits also assists in confirming that the exposures are being kept as low as reasonably achievable. Typical administrative limits are in the range of 100 millirem to 350 millirem per month. Exceeding these administrative limits is not an overexposure. Management may well want to investigate the situation as a part of their efforts to prevent an overexposure.

1.2 Special Reports

12-1-445 requires that special, prompt reports be made under certain circumstances. These initial reports are expected to be a complete evaluation of the situation and the registrant should not delay making these reports just because the information was incomplete. These special reports are to be made by telephone to the Agency at (602)-255-4845. After hours, you may call (602) 223-2212. The requirements for such reports are:

1. Any exposure in excess of 0.05 Sv (5 rems) in a 24 hour period. The Agency is to be notified within 24 hours of the registrant receiving such information. The registrant may investigate during the 24 hour period to determine the validity of such exposure.
2. Any exposure in excess of 0.25 Sv (25 rems). The Agency must be notified promptly by the registrant upon the registrant receiving the information. The registrant is not expected to have had time to investigate the report prior to notifying the Agency.

2. The Investigation

Once management has determined that an overexposure has occurred, an investigation is required to determine the cause and to provide management a basis for determining what corrective action may be appropriate. A systematic approach is preferred since it will;

1. Most likely get all of the facts, and
2. Probably prevent overlooking some aspect of the situation.

It is most important not to reach any conclusions until the investigation is complete.

The order of investigation provided in this guide is not the only order to be used, however any investigation should cover all of the issues identified here.

2.1 Procedure

1. The individual monitoring (film badge or TLD) report.

From this report determine:

- A. Is the exposure whole body, extremity, shin, or shallow-dose? This information is usually obtained from the report and is sometimes coded as badge type.
- B. The energy of the radiation. This may be a code or listed as shallow or deep, penetrating or nonpenetrating, or beta. Some companies list the estimated kVp of the radiation. It will be necessary to review all the reports contributing to the total reported that exceeded to limit.
- C. Any special notes such as:
 - Exposed through back of badge
 - Partially shielded
 - May have light or heat exposure.

From the information collected in this step, the following suggestions may help identify the problem:

- A. If this is an extremity or skin report, it may not be an overexposure because the limit for such is 0.5 Sv (50 rems).
- B. The reporting of high energy radiation or an effective energy above 200 kVp is almost always due to (1) not placing the film in the holder properly, (2) a loss of the filters in the film holder, or (3) exposure during a medical procedure when the individual was a patient in nuclear medicine. If the improper energy is used to evaluate film badges the report may be too high by a factor of 10 times.
- C. Light or heat damage reports indicate a need to investigate the storage and safe keeping of the badges.
- D. Reports indicating the badges were exposed through the back or partially shielded, indicate that (1) the location of the individual may not be proper, (2) the dose may have been under reported even though already an overexposure, or (3) the dose may not have been properly evaluated using the proper energy.
- E. It may be of interest to review other staffs exposure to see if any pattern are detectable, such as high exposure seem to move from one employee to another. If this is noted, check the

rotation schedule and determine if one or rooms have higher reading when staff are working in them.

2. After reviewing the individual monitoring report it may be appropriate to:

A. Contact the monitoring device supplier and attempt to resolve any applicable of the following;

- (1) If beta is reported for an x-ray exposure to a film badge ask for a review for heat, pressure, or other artifact.
- (2) If the film badge company reports the improper energy ask the supplier to confirm the energy evaluation and to supply a result based upon the proper kVp for the department.
- (3) If appropriate ask the supplier if any patterns are identifiable. If so they may give a clue as to what has occurred. Also the fact the film image indicates only one exposure is very important in most cases.

3. Discussion with the individual possibly overexposed.

A. In general, a straight forward approach in asking questions of the individual should be utilized. Remember the main objective is to correct mistakes, not go on vendettas. Also in many cases, the individual is afraid of the effects of radiation overexposures and must be reassured by telling the facts. Ascertain if the individual can remember any specific event or item that may have led to an overexposure. If the individual has worked for sometime doing the same basis duties without an overexposure, ascertain what, if any, changes have been made in techniques, work load, work station, repair of the facility or equipment, etc., which may have led to the overexposure.

B. Have the individual demonstrate suspect techniques or positions. It may be that by moving 2 or 3 inches the overexposure may be prevented. Note and discuss where and how the individual monitoring device is to be worn, where to stand during examinations, and any other items noted from the review above. It may be helpful to compare the positions, techniques, etc., with those of other individuals in the department.

4. Discussion with other individuals in the department may help develop areas needing further attention and consideration. Have all equipment, and rooms, checked to see that the shielding is still in place. Simple tests using film on suspect equipment can determine if collimation is working properly.

5. Quite often the cause of overexposures in x-ray departments is holding patients. Although forbidden by regulations, many individuals get lax and regularly hold patients. Facilities failing to provide adequate restraint devices are particularly prone to this problem.

7. If, after trying everything you can think of and is suggested in the guide, you still cannot identify the cause, do not be disturbed. A small percentage of the overexposures are never fully explained.
8. You may find that you can prove that the overexposure did not occur. In this case, the individual who supposedly received the overexposure may request a change of their record and if the Agency review confirms the conclusion a change will be authorized.