

# **CARDINAL SURVEYS COMPANY**

## **ALARA Concept**



# INTRODUCTION

The ALARA concept, as will be defined in this document, is Cardinal Surveys Company's program for maintaining occupational radiation exposure at safe levels for all employees and members of the general public. Safe exposure levels are defined herein, and in applicable State and Federal regulations.

## I. MANAGEMENT COMMITMENT

A. The management of Cardinal Surveys Company is committed to the program described herein for keeping individual and collective doses **As Low As is Reasonably Achievable (ALARA)**. In accord with this commitment, we hereby formalize our administrative organization for radiation safety and herein document the necessary written policy, procedures, and instructions to foster the ALARA concept within our company. The organization will include a Radiation Safety Committee (RSC) and a Radiation Safety Officer (RSO).

B. We will perform a formal annual review of the radiation safety program, including ALARA considerations. This will include reviews of operating procedures and past dose records, inspections, etc., and consultations with the radiation safety staff or outside consultants.

C. Modifications to operating and maintenance procedures and to equipment and facilities will be made if they will reduce exposures unless the cost, in our judgment, is considered to be unjustified. We will be able to demonstrate, if necessary, that improvements have been sought, that modifications have been considered, and that they have been implemented when reasonable. If modifications have been recommended but not implemented, we will be prepared to describe the reasons for not implementing them.

D. 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 will 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 or arbitrary level if this involved exposing additional people and significantly increasing the sum of radiation doses received by all involved individuals.

E. In the event that a state or federal regulation should require action by any member of the organization that creates a conflict with the ALARA concept, an evaluation of the spirit and intent of the regulation shall be conducted, and regulatory compliance sought while maintaining consistency with the ALARA concept.

## II. RADIATION SAFETY COMMITTEE (RSC)

### A. Review of Proposed Users and Uses.

1. The RSC will thoroughly review the qualifications of each applicant with respect to the types and quantities of materials and methods of use for which application has been made to ensure that the applicant will be able to take appropriate measures to maintain exposure ALARA.
2. When considering a new use of byproduct material, the RSC will review the efforts of the applicant to maintain exposure ALARA.
3. The RSC will ensure that the users justify their procedures and that individual and collective doses will be ALARA.
4. Delegation of Authority - The judicious delegation of RSC authority is essential to the enforcement of an ALARA program.
  - a. The RSC will delegate authority to the RSO for enforcement of the ALARA concept.
  - b. The RSC will support the RSO when it is necessary for the RSO to assert authority. If the RSC has overruled the RSO, it will record the basis for its action in the minutes of the quarterly meeting.
5. Review of ALARA Program
  - a. The RSC will encourage all users to review current procedures and develop new procedures as appropriate to implement the ALARA concept.
  - b. The RSC will perform a quarterly review of occupational radiation exposure with particular attention to instances in which the investigational levels in Table I are exceeded. The principal purpose of this review is to assess trends in occupational exposure as an index of the ALARA program quality and to decide if action is warranted when investigational levels are exceeded (see Section VI. below for a discussion of investigational levels.)
  - c. The RSC will evaluate our company's overall efforts for maintaining doses ALARA on an annual basis. This review will include the efforts of the RSO, authorized users, and workers as well as those of management.

### III. RADIATION SAFETY OFFICER (RSO)

#### A. Annual and Quarterly Review.

1. Annual review of the radiation safety program - The RSO will perform an annual review of the radiation safety program for adherence to ALARA concepts. This review will also include a review at a temporary job site to observe users of radiation are following the guidelines that are established for the use of radioactive materials. The annual review will be presented to the RSC. The minutes of the meeting will include the ALARA audit of users. Reviews of specific methods of use may be conducted on a more frequent basis.
2. Quarterly review of occupational exposures - The RSO will review at least quarterly the external radiation doses of authorized users and workers to determine that their doses are ALARA in accordance with the provisions of Section 6 of this program and will prepare a summary report for the RSC.
3. Quarterly review of records of radiation surveys - The RSO will review radiation surveys in unrestricted and restricted areas to determine that dose rates and amounts of contamination were at ALARA levels during the previous quarter and will prepare a summary report for the RSC.

#### B. Education Responsibilities for ALARA Program.

1. The RSO will schedule briefings and educational sessions to inform workers of ALARA program efforts.
2. The RSO will ensure that authorized users, workers, and ancillary personnel who may be exposed to radiation will be instructed in the ALARA philosophy and informed that management, the RSC and the RSO are committed to implementing the ALARA concept.

#### C. Cooperative Efforts for Development of ALARA Procedures.

Radiation workers will be given opportunities to participate in formulating the procedures that they will be required to follow.

1. The RSO will be in close contact with all users and workers in order to develop ALARA procedures for working with radioactive materials.
2. The RSO will establish procedures for receiving and evaluating the suggestions of individual workers for improving health physics practices and will encourage the use of those procedures.
3. The RSO will conduct an interactive review of users' handling procedures to insure that handling time is consistent with ALARA. This review will include examination of tools and techniques and an estimation of average handling times. This review will constitute the ALARA audit of users.

D. Reviewing Instances of Deviation from Good ALARA Practices.

The RSO will investigate all known instances of deviation from good ALARA practices and, if possible, will determine the causes. When the cause is known, the RSO will implement changes in the program to maintain doses ALARA.

## **IV. AUTHORIZED USERS**

A. New Methods of Use Involving Potential Radiation Doses.

1. The authorized user will consult with the RSO and/or RSC during the planning stage before using radioactive materials for new uses.
2. The authorized user will review each planned use of radioactive materials to ensure that doses will be kept ALARA. Trial runs may be helpful.

B. Authorized User's Responsibility to Supervised Individuals.

1. The authorized user will explain to the ALARA concept and the need to maintain exposures ALARA to all supervised individuals.
2. The authorized user will ensure that supervised individuals who are subject to occupational radiation exposure are trained and educated in good health physics practices and in maintaining exposures ALARA.

## **V. INDIVIDUALS WHO RECEIVE OCCUPATIONAL RADIATION DOSES**

- A. Workers will be instructed in the ALARA concept and its relationship to work procedures and work conditions.

B. Workers will be instructed in resources available if they feel that ALARA is not being promoted on the job.

The investigational levels in this program are not new dose limits but, serve as check points above which the results are considered sufficiently important to justify investigations.

---

Table 1  
Investigational Levels

		Level I	Level II
		mRems/ Month	mRems/ Month
Trainee	10	50	
Equipment Operator		100	200
Logger Operator		100	200
Tagmaster Operator		200	300
Lab. Technician	250	350	

---

## VI. INVESTIGATIONAL LEVELS - INDIVIDUAL RADIATION DOSES.

This company hereby establishes investigational levels for individual occupational external radiation doses which, when exceeded, will initiate review of investigation by the RSC and/or the RSO. The investigational levels that we have adopted are listed in Table 1. These levels apply to the exposure of individual workers.

The RSO will review and record the personnel monitoring not less than once in any calendar quarter. The following actions will be taken at the investigational levels as stated in Table 1:

A. Personnel dose less than Investigational Level I.

Except when deemed appropriate by the RSO, no further action will be taken in those cases where an individual's dose is less than Table 1 values for the Investigational Level I.

B. Personnel dose equal to or greater than Investigational Level I but less than Investigational Level II.

The RSO will review the dose of each individual whose quarterly dose equals or exceeds Investigational Level I and will report the results of the reviews at the first RSC meeting following the quarter when the dose was recorded. If the dose does not equal or exceed Investigational Level II, no action related specifically to exposure is required unless deemed appropriate by the Committee. The Committee will, however, review each such dose in comparison with those of others performing similar tasks as an index of ALARA program quality and will record the review in the Committee minutes.

C. Personnel dose equal to or greater than Investigational Level II.

The RSO will investigate in a timely manner the causes of all personnel doses equaling or exceeding Investigational Level II and, if warranted, will take action. A report of the investigation, any action taken, and a copy of the individual's records will be presented to the RSC at its first meeting following completion of the investigation. The details of these reports will be included in the RSC minutes.

D. Reestablishment of investigational levels to levels above those listed in Table 1.

In cases where a worker's or a group of workers' doses need to exceed an investigational Level I, a new, higher investigational level may be established for that individual or group on the basis that it is consistent with good ALARA practices. Justification for new investigational levels will be documented. The RSC will review the justification for and must approve or disapprove all revisions of investigational levels.

## **VII. SIGNATURE OF CERTIFYING OFFICIAL**

I hereby certify that this company has implemented the ALARA program set forth above.

---

James S. McLaughlin  
President  
Cardinal Surveys Company