



Harvard University
Radiation Safety Committee

ALARA Policy

Harvard University follows the policy of minimizing radiation exposures to individuals or releases of radioactivity to the environment resulting from work with radioactive materials. This policy is known as ALARA, an acronym for As Low As Reasonably Achievable. This document sets forth the University's operational plan for implementing ALARA. The plan is based on the Nuclear Regulatory Commission's definition of ALARA, which is maintaining exposures as far below the regulatory limits as practical with consideration of economics, state of technology, and other societal and socioeconomic considerations. To be effective, the plan seeks to establish goals which are accepted by all levels of management and those involved in the use of radioactive material.

Responsibilities

The Radiation Safety Committee (RSC) is responsible for maintaining oversight of activities under the plan. It reviews measures to achieve ALARA. It examines individual and collective doses and releases to the environment for conformance with ALARA. It conducts a comprehensive annual audit of the radiation protection program including the effectiveness of adherence to ALARA concepts. This audit includes review of operational procedures, authorization approvals, radiation incidents, radiation dose records and environmental release data. The Table sets the ALARA goals and the standards for achieving these goals.

The Radiation Protection Office (RPO) is responsible for executing the plan through the following measures:

- Follow ALARA guidelines in reviewing and approving proposed uses of radioactive materials and recommend modifications to experiments where indicated.
- Identify measures to achieve ALARA, such as use of protective devices, operational controls, and consideration of ALARA in designing experiments.
- Formulate written procedures where applicable in specific instances.
- Monitor and track all activities affecting potential exposures of workers and the public.
- Provide the training and guidance necessary to University management, the RSC, Authorized Users and University staff to meet the goals of the ALARA plan.
- Review records of radiation surveys, occupational exposures, and environmental releases at least quarterly to determine compliance with ALARA and good practice principles.
- On an annual basis, the RPO will conduct a comprehensive review of the radiation protection program for adherence to ALARA concepts and for general program functionality.

Standards

Standards for achievement of ALARA goals are given in the Table. The Table gives measurement levels at which prescribed actions are to be taken by the Radiation Protection Office. If a measurement point is below Level I for a calendar quarter, no additional action will be required. Should the value be between Level I and Level II, the RPO will review the circumstances and, at its discretion, take additional steps to investigate and/or take action to reduce the value. Any value which exceeds Investigation Level II requires investigation and efforts to reduce the exposure with consideration of total cost and scientific impact. Reports of all investigations shall be presented, along with an exposure/release history, to the RSC.

Laboratory Safety

Table

ALARA Plan Goals and Investigation Levels				
	Regulatory Limit	Goal	Level I	Level II
Whole Body Exposures	5000 mrem/y	500 mrem/y	125 mrem/q	375 mrem/q
Lens of the Eye	15000 mrem/y	1500 mrem/y	375 mrem/q	1125 mrem/q
Skin and/or Extremity	50000 mrem/y	5000 mrem/y	1250 mrem/q	3750 mrem/q
Minors (whole body)	100 mrem/y	50 mrem/y	10 mrem/q	30 mrem/q
Embryos/Fetus	500 mrem/9 month gestation	50 mrem/in 9 month gestation period	10 mrem/q	30 mrem/q
Member of Public onsite (EPA)	100 mrem/y whole body exp.	20 mrem/y	5* mrem/q	15* mrem/q
Member of Public offsite (EPA) ¹	10 mrem/y with less than 3 mrem due to radioiodine from airborne releases	3 mrem/y	1* mrem/q	3* mrem/q
Environmental Releases ²	10 CFR 20 Appendix B averaged over one year at the unrestricted area boundary.	10% of 10 CFR 20 Appendix B averaged over one year at the boundary; or listed value at the stack	10% of 10 CFR 20 Appendix B averaged over the calendar quarter at the boundary; or listed value at the stack.	30% of 10 CFR 20 Appendix B averaged over the calendar quarter at the boundary; or listed value at the stack.

* Mathematical models are used to calculate dose based on releases to the environment.

1 - EPA regulations apply to airborne exposure to a member of the public while NRC regulations apply to all sources of radiation from the institution to the highest exposed member of the public.

2 - Values based on total effective dose equivalent of 50mrem per year.