Radiological Health Support Operations

BRIEF

Policy Summary

This policy describes Berkeley Lab’s requirements for the monitoring of individuals and workspaces for radiation exposure levels, contamination, and airborne radioactivity.

Who Should Read This Policy

All persons who plan to work in or near an area controlled for radiological protection or who plan to work with or support work with radiation-generating devices or radiological materials

To Read the Full Policy, Go To:

The POLICY tab on this wiki page

To Read the ES&H Program Details, Go To:


Contact Information

David Kestell
Radiological Control Manager
Environment/Health/Safety Division
Environment, Waste, and Radiation Protection Department
djkestell@lbl.gov

Policy

<table>
<thead>
<tr>
<th>Title:</th>
<th>Radiological Health Support Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publication date:</td>
<td>11/4/2013</td>
</tr>
<tr>
<td>Effective date:</td>
<td>11/4/2013</td>
</tr>
</tbody>
</table>

POLICY

A. Purpose

This policy describes Berkeley Lab’s requirements for the monitoring of individuals and workspaces for radiation exposure levels, contamination, and airborne radioactivity.

B. Persons Affected

All persons who plan to work in or near an area controlled for radiological protection or who plan to work with or support work with radiation-generating devices or radiological materials

C. Exceptions
D. Policy Statement

D.1 Personnel Monitoring

1. **External Dosimetry:** Berkeley Lab's external dosimetry program is managed by the Radiation Protection Group (RPG). Elements of the program include, but are not limited to, the following:
   a. Radiation workers exposed to external ionizing radiation will be issued a dosimeter as required by their work authorization.
   b. RPG provides extremity dosimeters for personnel who have the potential to receive an extremity dose that is significantly higher than the whole-body dose.
   c. RPG provides electronic personnel dosimeters (EPDs)

2. **Internal Dosimetry**
   a. Berkeley Lab's internal dosimetry program is managed by the RPG and includes:
      b. In vitro (body fluid) monitoring
      c. In vivo (whole-body counting) analysis

D.2 Workplace Monitoring

1. **General:** Workplace monitoring provides a basis for posting and labeling of areas and equipment, developing work authorizations, implementing as low as reasonably achievable (ALARA) measures, issuing individual monitoring devices, and verifying the efficacy of design measures and engineering controls.

2. **Passive Area Dosimetry:** To demonstrate that the doses outside Radiologically Controlled Areas are negligible, the RPG has established and maintains a comprehensive area dosimetry program (passive dosimeters). The measurements provide information that supports radiological safety decisions, particularly with regard to personnel doses and the requirement to monitor individual personnel doses.

3. **Active Area Monitoring:** To demonstrate that the doses outside Radiologically Controlled Areas are negligible, the RPG has established and maintains a comprehensive area monitoring program (telemetered instruments). The measurement results provide information that supports radiological safety decisions, particularly with regard to personnel doses and the requirement to monitor individual personnel doses.

4. **Surveys:** Routine and periodic radiation and/or contamination surveys look for changes in conditions, ensure that controls are adequate, decommission areas, or release equipment and materials. These surveys are performed by:
   a. Radiation workers (users)
   b. RPG staff
   c. Specifically trained and authorized personnel

5. **Air Monitoring:** Based on an RPG assessment of the operation and in accordance with RPG procedures, air sampling will be performed within areas where there is the potential for airborne radioactive contamination.

D.3 Instrumentation

RPG provides radiation workers with appropriate, calibrated radiation-detection equipment. The RPG provides guidance in the selection of instruments, in addition to instrument distribution, calibration, and maintenance.

E. Roles and Responsibilities

<table>
<thead>
<tr>
<th>Role</th>
<th>Responsibility</th>
</tr>
</thead>
</table>
| Radiation Protection Group (RPG) | • Provides appropriate external dosimetry to radiation workers  
                                      • Implements internal dosimetry measures, as required  
                                      • Assesses areas and operations for the potential of airborne radioactive contamination; establishes appropriate sampling  
                                      • Maintains and provides instrumentation to the radiation workers  
                                      • Establishes and maintains the passive area dosimetry program  
                                      • Establishes and maintains the active area monitoring program  
                                      • Performs routine and periodic radiation and contamination surveys |
| Radiation worker            | • As authorized, performs routine and periodic radiation and contamination surveys  
                                      • Acquires external dosimetry, as required by the work authorization  
                                      • Participates in the internal dosimetry program, as required by the work authorization |
| Supervisor/manager          | Verifies radiation workers have external dosimetry and participate in the internal dosimetry program, as required by the work authorization |
F. Definitions/Acronyms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>External dosimetry</td>
<td>Methods for measuring amount of energy deposited in body tissues from external sources</td>
</tr>
<tr>
<td>Internal dosimetry</td>
<td>Methods for measuring amount of energy deposited in body tissues from internal sources</td>
</tr>
<tr>
<td>As low as reasonably achievable (ALARA)</td>
<td>ALARA describes an approach to radiological management and control that aims to keep exposures (individual and collective) of the workforce and of the general public at levels as low as is reasonable, taking into account social, technical, economic, practical, and public-policy considerations.</td>
</tr>
<tr>
<td>Radiological Area</td>
<td>Any area within a Radiologically Controlled Area that must be posted as a Radiation Area, High Radiation Area, Very High Radiation Area, Contamination Area, High Contamination Area, or Airborne Radioactivity Area</td>
</tr>
<tr>
<td>Radiologically Controlled Area</td>
<td>Any area to which access is managed to protect individuals from exposure to radiation or radioactive materials. Individuals who enter Controlled Areas without entering Radiological Areas are not expected to receive a total effective dose equivalent of more than 0.1 rem (0.001 sievert) in a year.</td>
</tr>
<tr>
<td>Work authorization</td>
<td>An authorization for the use of radiation-producing machines and/or radioactive materials. Precautions, limits of use, and requirements are specified.</td>
</tr>
</tbody>
</table>

G. Recordkeeping Requirements

The care, maintenance, and disposition of RPG records will be done in accordance with Berkeley Lab records management policies and procedures, as listed in the Requirements and Policies Manual (PUB-201).

H. Implementing Documents

<table>
<thead>
<tr>
<th>Document number</th>
<th>Title</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>07.08.001.001</td>
<td>Radiation Protection Program</td>
<td>Program</td>
</tr>
<tr>
<td>N/A</td>
<td>Radiation Protection Group (RPG) Web site</td>
<td>Web site</td>
</tr>
<tr>
<td>EHS 704</td>
<td>Establishing the Need for Personnel and Area Radiation Monitoring</td>
<td>Procedure</td>
</tr>
<tr>
<td>EHS 708</td>
<td>Survey of Potentially Contaminated Materials and Equipment for Unrestricted Release</td>
<td>Procedure</td>
</tr>
<tr>
<td>EHS 710</td>
<td>Radiological Survey Program</td>
<td>Procedure</td>
</tr>
<tr>
<td>EHS 713</td>
<td>Radiological Air Sampling Program</td>
<td>Procedure</td>
</tr>
<tr>
<td>EHS 723</td>
<td>Area Radiation Monitoring Program</td>
<td>Procedure</td>
</tr>
<tr>
<td>EHS 753</td>
<td>Operation and Use of Radiation Measurement Instrumentation</td>
<td>Procedure</td>
</tr>
</tbody>
</table>

I. Contact Information

David Kestell  
Radiological Control Manager  
Environment/Health/Safety Division  
Environment, Waste, and Radiation Protection Department  
djkestell@lbl.gov

J. Revision History

<table>
<thead>
<tr>
<th>Date</th>
<th>Revision</th>
<th>By whom</th>
<th>Revision Description</th>
<th>Section(s) affected</th>
<th>Change Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/4/2013</td>
<td>0</td>
<td>Q. Le</td>
<td>Re-write for wiki</td>
<td>All</td>
<td>Major</td>
</tr>
</tbody>
</table>

Document Information

Lawrence Berkeley National Laboratory. The official or current version is located in the online LBNL Requirements and Policies Manual. Printed or exported versions are not official. Users are responsible for working with the latest approved revision.