# Radiation Exposure: How Much Is Too Much?

*"A reasonable approach to monitoring your radiation exposure is to understand how radiation is measured and what those measurements might mean for you."*

Since the Japanese earthquake and subsequent problems with several reactors close to the city of Sendai, press reports of radiation leaks have been continually in the news. However, these press reports have done little to educate the general public on what an acceptable level of radiation exposure, how we are exposed to radiation from many sources (man-made and natural), and what we can do to reduce our exposure. This article addresses these three concerns:

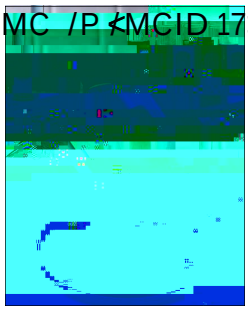
What is an acceptable level of radiation exposure?

(*continued from previous page*) 100 *rem*.

The U.S. Nuclear Regulatory Commission (NRC) sets an acceptable level of radiation exposure from any one source at 100 millirem a year. In contrast, the average level of natural background radiation in the United States is about 350 millirem a year. (A chest X-ray, for further comparison, gives the equivalent to 1 or 2 millirem to the whole body.)

## How are you exposed to radiation from sources, man-made and natural?

As you can see from the pie graph, most of the radiation the average person receives comes from a relatively even distribution of man-made and natural sources. For the typical person, *longitudinal exposure* comes from natural sources such as radon (see last month"s article in our *EHS Newsletter* on radon exposure) which is released naturally from the soil and can affect people who live in houses with basements that do not have proper ventilation and/or radon abatement systems. *Acute* or *periodic exposure* comes primarily from medical procedures. Certain types of imaging tests, such as x-rays, CT scans, and nuclear medicine tests (such as PET scans and bone scans) expose people to low levels of radiation in order to create internal pictures of the body. (MRI and ultrasound exams do not use ionizing radiation.) Minor sources of exposure include consumer products, sunlight (depends on location and length of time, of course), food like bananas with high levels of potassium, and yes, even your own body eTBmtedreaysation trelledrecans!JETBT1 0 0 1 213.63 361.01 Tm[bodyTJET EMC /P <MCID 17>8DC B





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# *Inactive AU Status, Absence from Laboratory*

*"The RSOF has an AU classification of „Inactive AU" status for laboratories that do not need to possess or use radioactive material (RAM) for the foreseeable future or in „Storage Mode" for more than one year."*

## Policy

The RSOF has an AU classification of „Inactive AU" status for laboratories that do not need to possess or use radioactive material (RAM) for the foreseeable future or in „Storage Mode" for more than one year. An inactive AU is relieved of the requirements to send in environmental release summary reports, complete laboratory contamination surveys, and adhere to the annual retraining policy

## What do I need to do to become inactive?

1. Send a letter of intent to the RSOF. This can be either a fax or an email.
2. Follow the guidelines as stated in the Laboratory Decommissioning/ Laboratory Relocation section of this manual.
3. Return all personnel dosimeters to the RSOF

## What if I want to become active again?

If you have been „Inactive" for less than one year:

1. Send a letter to the RSOF requesting reactivation. This can be either a fax or an email.
2. Send updated room maps with survey locations, as well as an updated protocol to the RSOF.
3. Verify that survey meter instruments are within annual calibration.
4. Verify that radiation workers, ancillary radiation workers, and the AU were retrained within the past year.
5. Obtain required personnel dosimeters for radiation workers, ancillary radiation workers, and AU.
6. Replace all required postings and labels.

If you have been „inactive for more than one year:

1. Resubmit RAM application, for RSC Review.

## What if I store isotopes in my laboratory, have not used them for an extended period of time, but still want to retain active AU status?

The AU may request that the laboratory or laboratories under his/her supervision be formally in „Storage Mode," meaning isotopes will be retained in storage but not used until the laboratory is reinstated to active-use mode. For periods of isotope use exceeding six calendar months, required AU survey frequency shall be reduced to once each six calendar months, starting on the date of declared

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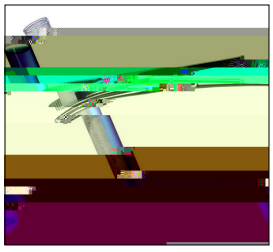

# *Inactive AU Status, Absence from Laboratory (continued from page 4)*

...non-use. A letter from the AU must be submitted to the RSOF to start this reduced survey frequency. This can be either a fax or an email. Resumption of isotope use shall not occur until and unless a letter to the RSOF reinstates regular survey frequency. "Storage Mode" lasting greater than one year will be reviewed to determine if they should go „Inactive" or they intend to become „Active" again.

### What if I do not have isotopes in my laboratory, but still want to retain active AU status?

The AU should survey the laboratory monthly or decommission the laboratory for radioactive material (RAM) use. If the AU decides to use radioactive materials (RAM), contact the RSOF so the room can be posted with the appropriate signage and labels. The AU will be made „Inactive" if no isotope is used or stored in the laboratory for more than six months.

### What if I'm going to be absent from my laboratory?

If you are going to be absent from your laboratory for greater than five working days, designate another AU (not a technician) to assume responsibility for all radiation safety issues. Please contact the Assistant RSO indicating the date you are leaving, when you will be returning, as well

*"If you are going to be absent from your laboratory for greater than five working days, designate another AU (not a technician) to assume responsibility for all radiation safety issues."*

Oftentimes, when we know something well, we take that knowledge for granted. Obviously, taking simple activities like tying our shoes or brushing our teeth is no problem. But when working with chemicals in the lab, we can never take safety procedures for granted. As a reminder, a number of rules for safe laboratory practices are outlined below. This list is intended to provide a practical base line for laboratories required to handle hazardous chemicals. Because of the nature of specific chemical hazards, this list is not comprehensive, but it will help PIs provide an appropriate safety plan for laboratories. Please remember that EHS is available for consultation on all safety and health-related issues:

a. All heating of potentially hazardous chemicals must be performed in a chemical hood. Prior to heating a liquid, place boiling stones in vessels (other than test tubes). Use an alcohol thermometer (mercury thermometers are prohibited in laboratories) in a boiling liquid if there is the possibility of a dangerous exothermic decomposition, as in some distillations. Explosions are one of the most serious physical hazards in the laboratory.
b. NEVER place your nose directly over a container to smell the contents.

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