



# RADIATION REVIEW



**UW - Madison Safety Department**

**Radiation Safety Program**

**30 N. Murray St.**

**262-8769**

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**<http://www.wisc.edu/safety>**

## **Security and Surveillance**

Big problem here. While radioactive material is used safely and in small quantities, rooms containing radioactivity must be locked when unoccupied. A room unsecured and unoccupied which contains radioactive material could result in a Nuclear Regulatory Commission (NRC) violation and fine. This response has been seen at Yale, Ohio State, etc.

During the past 2 inspections, NRC auditors have noted that security was very weak and surveillance practically nonexistent. Security and surveillance is every person's concern because a violation identified will affect all PIs and radiation labs. The NRC intimated that the UW will need to initiate an effective program to address this issue if we are to avoid fines and violations in the future. Over the next month or so we will be trying to set up some system. We could use your input on how such a system should work, but PIs will have to be accountable for their labs.

## **New England Nuclear**

NEN was sold by DuPont. Previously, radionuclides were delivered by Federal Express, arriving by 9:30 am. NEN will now use Airborne. Delivery time will be between 10:30 am and 12:00 noon. During this transition, some deliveries may be delayed.

## **Liquid Containers**

Safety will give labs small volume, aqueous radioactive waste bottles. We have 1 and 2 liter and 1 gallon plastic bottles. Call Safety or send us an eMail from our Internet site for bottles. Try not to write on the bottles. We recycle them. If you need to write on something, use a piece of tape attached to the container.

## **Training Schedule**

Here's the training schedule through September. All training is conducted at Union South and begins at 12:30 PM.

6 Jun	3 Jul	7 Aug	5 Sep
12 Jun	10 Jul	13 Aug	12 Sep
18 Jun	16 Jul	19 Aug	19 Sep
24 Jun	22 Jul	25 Aug	25 Sep
	28 Jul		

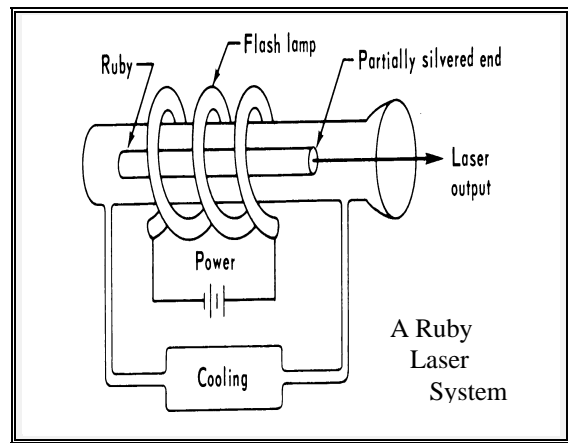
## Lasers

Lasers produce very narrow, intense monochromatic (i.e., one color) and coherent (i.e., in phase) beams of light. Today, laser devices are commonly found in many work areas. Examples of these are some check-outs, inventory maintenance, land survey, data storage/retrieval (e.g., CD), designating. Properly emplaced and operated, laser devices can be of great benefit. However, some lasers may be capable of producing injury if improperly used or handled.

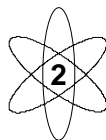
Lasers are regulated by the Food & Drug Administration. Normally, the FDA attempts to insure marketed lasers can be operated safely. However, even when operated properly, some lasers are capable of causing injury.

Lasers are divided into classes. Class IIIB and Class IV lasers present the greatest hazard to unprotected eyes. To protect against injury, commercially sold laser systems carry one of two basic kinds of laser warning signs. Caution signs indicate that there is a laser light and it may cause some dazzling, but should not be capable of producing permanent injury. Most commonly these are found at store checkouts, positioning and some designating lasers. Danger signs are used for lasers which emit light of an appropriate color/frequency and cross sectional power density to be capable of producing injury.

These include flow cytometry, welding, surgery, etc. The primary risk from lasers is injury to the eye. Research lasers need to be evaluated by the users and suitable precautions established.



Most laser systems, if properly used are completely safe. Unfortunately, just as with other research tools, personnel changes may result in untrained or uninitiated workers attempting to use a potentially dangerous laser without adequate knowledge of the laser hazards and administrative requirements. Chapter 14 in the *Radiation Safety for Radiation Workers* manual (this may also be reviewed on our web site) addresses laser safety. We have a Health Physicist with special training in laser safety. If you require more information than you received here or have questions about the lasers in your lab, please call Arne Jansen at 2-8769.



### Survey Requirements

Have you ever wondered why the normal room survey requirement is monthly? Survey requirements are based upon radiotoxicity, activity used in a given operation, the type of operation and the workplace design.

The International Labour Organization has published a listing of radiotoxicities. For UW researchers, the following table applies:

The activity to be used in a procedure is taken from both the lab's CORD order limits and any special protocols for high activity uses. Except in special situations, we consider most research operations to be very simple wet operations.

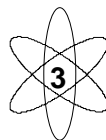
RadioToxicity	Radionuclide				
<b>High</b>	<sup>22</sup> Na	<sup>45</sup> Ca	<sup>125</sup> I		
<b>Moderate</b>	<sup>14</sup> C	<sup>32</sup> P	<sup>33</sup> P	<sup>35</sup> S	<sup>51</sup> Cr
<b>Low</b>	<sup>3</sup> H				

We merge radiotoxicity, activity and operation to determine the room type required and survey frequency. Room types are either I, II, or III based upon the following activities:

Radiotoxicity Group	Type of Workplace		
	Type I	Type II	Type III
<b>Very High</b>	# 13.5 :Ci	13.5 :Ci - 13.5 mCi	\$ 13.5 mCi
<b>High</b>	# 135 :Ci	135 :Ci - 135 mCi	\$ 135 mCi
<b>Moderate</b>	# 1.35 mCi	1.35 mCi - 1.35 Ci	\$ 1.35 Ci
<b>Low</b>	# 13.5 mCi	13.5 mCi - 513.5 Ci	\$ 513.5 Ci

A Type I room is similar to good quality chemical labs and normal ventilation is usually sufficient. Type II rooms are specially designed for radioisotope work; airborne levels are controlled by totally ventilated fume hoods and negative pressures are preferred. Type III rooms are specially designed and constructed for handling large quantities; glove boxes are preferred.

Most labs are likely to be Type I, some hot labs and iodination rooms may be Type II. While Type III can not be ruled out, they are very unlikely. Type I rooms normally require monthly surveys except for rooms used only for storage which, if requested, can be placed on a semiannual schedule. Type II rooms are normally surveyed after each use of activity within the room. Regardless of lab type, monitoring yourself and work area with survey meters must be done after procedures using unsealed radioactive material.



**CORD Hours**

In the last newsletter, we promised to reduce costs and pass those savings to you. Recently one CORD worker transferred to another branch of FP&M. We then eliminated the \$6 per case (Biosafe) LSC vial processing fee (the \$30 per case penalty for organic vials is still in effect). To more effectively use CORD workers, beginning 1 June, we will change the CORD order taking hours to:

10 - 11:30 AM  
12:30 - 2 PM

This will allow the three CORD workers to maintain data (e.g., entry of disposal, personnel, lab information), receive radioactive materials and prepare them for delivery. Try using our Internet order page:

<http://www.wisc.edu/safety>

This is a viable, rapid way to place orders. If we receive an Internet order before 12:00 Noon, we will place it that day.

**Aqueous Liquids**

In the past some industrial operations dumped radioactive metals (e.g., Thorium-magnesium, Cesium-137, etc.) into the sanitary sewer. As time passed, these metals concentrated in local sewage treatment plants, increasing worker exposure and costing millions to clean. To correct this problem, the NRC has redefined "Aqueous" for aqueous liquids. The new interpretation is that the liquid must be soluble (i.e.,  $K_{sp} > 10E-5$ ) or listed "soluble" in the CRC handbook.

Please help us determine solubility, by listing chemical components of your aqueous liquid waste containers and carboys on both the liquid waste tag and the disposal form.

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