



RADIATION REVIEW



UW - Madison Safety Department
103 N. Lake St. 262-8769

Radiation Safety Program
February 1995

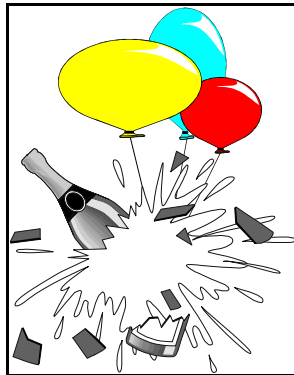
NRC Inspection Results

Summary

Most of you know UW was inspected by 4 NRC inspectors from 1 - 5 August and again by 2 inspectors on 20 - 21 September. The final inspection results are in and you all deserve praise. Your diligent effort and attention to detail resulted in a inspection which, though not violation free, had only minor violations with no fines.

The notice listed 6 violations and 6 areas of concern. Three of the violations and 2 of the areas of concern were related to clinical applications. Violations are activities which were conducted contrary to some regulation or license condition. Areas of concern are items which the NRC believes may either lead to a violation or increase the risk of radiation exposure either to workers or members of the general public.

Violations and Items of Concern from research (i.e., non-medical) activities, along with our draft responses are listed. The final response is to be sent to the NRC about January 30. Two notes: 1. Some of these violations are specific, we have omitted nothing from the specific citations simply because the NRC's notice is a matter of public record. 2. Violations 1 and 2 both are security related.



Notice of Violation

1. 10 CFR 20.2001(a)(1) requires, in part, that a licensee dispose of licensed material only by transfer to an authorized recipient. Contrary to the above, on or about June 1, 1994, bags containing approximately 137 microcuries of phosphorus-32 were removed from Room D4/211 of University Hospital and subsequently disposed of by transfer to an unauthorized recipient.

*The University notified the NRC immediately (FAX on June 10, letter on June, 22) when it was apparent that inadvertent disposal of that material had occurred. As indicated in that notification, upon investigating the incident we determined the root cause to be confusion regarding the specific waste stream in which to classify this waste. To correct this confusion and to insure against further such incidents we have required more conspicuous labeling of radioactive waste containers **and** the utilization of waste containers specific to radioactive waste, to wit, **yellow bags**.*

2. 10 CFR 20.1802 requires that the licensee shall control and maintain constant surveillance of licensed material that is in a controlled or unrestricted area and that is not in storage.



Contrary to the above, on August 2, 1994, licensed material in Room 204 in the Nutritional Science Building was not under the control and constant surveillance of the licensee.

Safety Department personnel discussed this finding with the responsible lab group stressing the importance of adequate surveillance. Additionally, we will reiterate to all workers in our next newsletter the necessity to maintain constant surveillance of licensed material in radiation work areas.

Security of radioactive materials is paramount in any radiation safety program. The University aggressively addresses security issues with principal investigators in a myriad of formats. Merely a few of these include:

- a. Investigators, when completing their request for authorization to possess radioactive material describe their security procedures.*
- b. When Safety staff audit each principal investigator's program, security of radioactive materials is one of the items addressed.*
- c. Training of new workers and newsletters promulgated to all radiation workers continually stress the need for security.*
- d. University Police and Security continually patrol campus facilities noting unsecured areas. When notified of an unsecured area, Radiation Safety addresses the problem with the principal investigator and seeks assurance that such incidents will not occur in the future.*

But, on the other hand, securing 1700 labs in over 77 buildings while providing access to 4000 radiation workers and researchers, is a complex issue. Perhaps the magnitude of the effectiveness of our efforts can be gauged against the NRC's definition of security: "To secure the material ... means to make certain, to guarantee, and to ensure that there is no unauthorized removal of the material." Given the size of the program at the UW, the very fact that during the past 2 years, only 1 reportable loss of radioactive

material occurred, and in that instance allegedly removed by custodial staff from a secured lab, attests that we have good control over licensed material.

- 3. Condition 32.B. of License No. 48-09843-18 requires that licensed material be possessed and used in accordance with statements, representations and procedures contained in a letter dated November 8, 1993. Item 5 of the letter dated November 8, 1993 states that the survey program described in Section IX of the UW Radiation Safety Regulations (UWRSR) will be followed. Section IX of the UWRSR states, in part, that laboratories where quantities greater or equal to 5 millicuries of radioiodine are used require a survey of that area immediately after iodine use. Contrary to the above, on June 27, 1994, 5 millicuries of iodine-125 were used in Laboratory No. 311 and an immediate survey of the area was not performed.*

In this particular incident, Radiation Safety implemented a 4-pronged response: training, surveys, bioassays, and radioactive waste. The ability of the lab to follow through on these items is reviewed quarterly by a member of the Radiation Safety Office.

Ensuring radiation safety at the University is a multifaceted program. As noted above, personal involvement between Safety and the principal investigator begins even before the researcher is authorized to possess and use radioactive materials. Our Health Physics Procedures manual details this involvement: interview with new user, review of requirements during triennial renewal, briefing with user during the lab's ALARA audit.

Competing with this program is the fact that the researcher and radiation worker population is constantly in flux (we experience approximately 15% turnover in personnel), many new workers are initially more familiar with their previous facilities' requirements than UW. It is through constant communication with all UW personnel that a uniform attitude to safety and compliance is achieved.

As demonstrated by this incident, which UW Radiation Safety identified, mitigated, and implemented corrective action, the ALARA program is proactive. The annual audit of researchers (described in our 9 Sept, 1993 letter) provides Radiation Safety with not just a snapshot of the particular lab, but when compiled and compared with all 400 researchers, provides indications on weak areas in the entire research community which we can then address, reducing the risk of further incidents.

Areas of Concern

3. No mechanism appears to be established for the dissemination of information on new NRC requirements and changes in University procedures to laboratory workers who use licensed material.

The Radiation Safety Office has excellent communication mechanisms in place. This Office utilizes a newsletter targeted to users and lab managers as just one mechanism to keep all personnel abreast of changes in radiation safety. This newsletter is normally published at least 4 times a year or as the need arises to address special situations. Additionally, the RSO promulgates information regarding significant program changes to principal investigators via mass mailings (often both hard copy and eMail) specifically addressed to those users. Other information conduits include our communications with the users and lab workers during each lab's ALARA audit. Radiation Safety personnel have been working in the program for an average of 8 - 10 years. This longevity provides them with a knowledge of researchers and radiation workers that is often lacking in programs with less

experience. The experience, coupled with inventory information, provides Safety with the ability to detect users not complying with regulations as well as the ability to deal with users who have not implemented programs to handle their own responsibility. We continually reiterated to inspectors that lack of communication was not perceived to be an issue at the UW and that communication issues centered on mechanisms to enhance our already excellent in-place communication procedures.

5. A tour of the incinerator at the Herrick Road disposal site revealed a crack in the refractory wall. At the time of the inspection, no evaluation had been performed to determine potential release of radioactive effluents via the crack during incinerator operations.

We informed the inspectors that we believed the refractory crack developed as a result of incomplete curing of the refractory in 1986 when it was replaced. We are moving ahead with plans to replace the facility with one of more modern design and have every reason to believe these plans will eventually be successful. We do not believe that there are any releases of effluents via the crack because there are no indications of any releases (e.g., heat and/or air streaming through the outside of the incinerator building other than the stack). Regardless, we do not believe that possible radioactive effluents are of concern because of the way waste is selected for this volume reduction mechanism. Incineration is performed as part of a decay-in-storage program. Our desire is to decay all waste until it is not radioactive and then incinerate it. This works with approximately 60% of our waste activity.



Waste is selected for incineration only if the complete vaporization of each identified nuclide would **not** result in effluents exceeding 20% of the Part 20 limits. Thus, the hypothetical concentration through any refractory cracks (we have no indication that this is a plausible route) would be negligible.

6. Transportation of radioactive materials to various locations on campus via public roads may not be in compliance with U.S. Department of Transportation (DOT) requirements. This area was not inspected in detail during the inspection, however, it appeared that packages were being delivered without meeting the DOT requirements for Type A packages or for packages being shipped as "limited quantities" pursuant to 49 CFR 173.421.

The University has procured new shipping containers and performed testing to certify these containers to meet Type A requirements.

Training

Radiation Worker training will be conducted beginning at 12:30 on the dates indicated below. The class is 4 hours long with a comprehensive exam based on the *Radiation Safety for Radiation Workers* booklet. All training is conducted in Biochemistry Rm. 1B. Call Radiation Safety at 2-8769 or 5-5241 to receive a copy of the booklet.

Radiation Safety Training	
1B Biochemistry	
Date	Date
1 Feb	5 Apr
10 Feb	12 Apr
15 Feb	21 Apr
20 Feb	26 Apr
3 Mar	1 May
8 Mar	12 May
16 Mar	16 May
20 Mar	25 May
31 Mar	

UW-Safety Dept.
103 N. Lake St. 53715-1212

(608)262-8769

