☢ RADIATION REVIEW

UW - Madison Safety Department
262-8769

Radiation Safety Program
September 1992

WE WELCOME A NEW RADIATION SAFETY OFFICER

Starting October 10, 1992, Mr. Ronald Bresell, presently with the US Army Academy of Health Sciences, Fort Sam Houston, Texas will be the Radiation Safety Officer for UW-Madison. We welcome Mr.Bresell and look forward to working with him. Our thanks also to the faculty and staff on the search committee for their efforts.

OTHER CHANGES

Sheileen Doyle has taken a leave of absence from her position as Health Physics Technician to continue her education. Jim Pence, formerly the CORD Health Physics Technician will take over her duties. John Durand has been hired as an LTE for the CORD job.

RADIATION SAFETY REGULATIONS

TRANSFER OF MATERIAL

Whenever radioactive material is transferred between buildings, between authorized users, or to campus from an outside source, CORD must first be notified. CORD will verify that the recipient is authorized for the type and quantity of mate- rial being transferred. Appendix V of the yellow Radiation Safety Regulations binder lists the activity levels above which transfers between campus buildings must be done by Safety Depart- ment personnel. CORD will fill out a "Radioac- tive Waste Disposal" form and adjust the inventories of both authorized users involved in the transfer. Transfers of quantities below these amounts may be done by an authorized laboratory worker. The person trans- ferring the material must verify the recipient is authorized for the nuclide and quantity before the transfer, then report the transfer to CORD on a "Radioactive Waste Disposal" form within one week. Radionuclide receipts from an outside source, including material from the VA hospital, free samples, evaluation shipments, custom syntheses, etc., must be ordered and shipped through CORD. CORD will do the proper documentation and package monitoring as re- quired by the Nuclear Regulatory Commission. Call CORD to inform them of all such shipments and any special han- dling necessary. CORD will deliver the material and adjust the recipient's inventory. If you re- ceive any material contrary to the above instructions, and do not have ap- proval to do so, notify CORD immediately.

UW Safety Dept./CORD 2-6511
317 N. Randall Ave.
Madison, WI 53715

TRAINING MATERIAL TO BE AVAILABLE

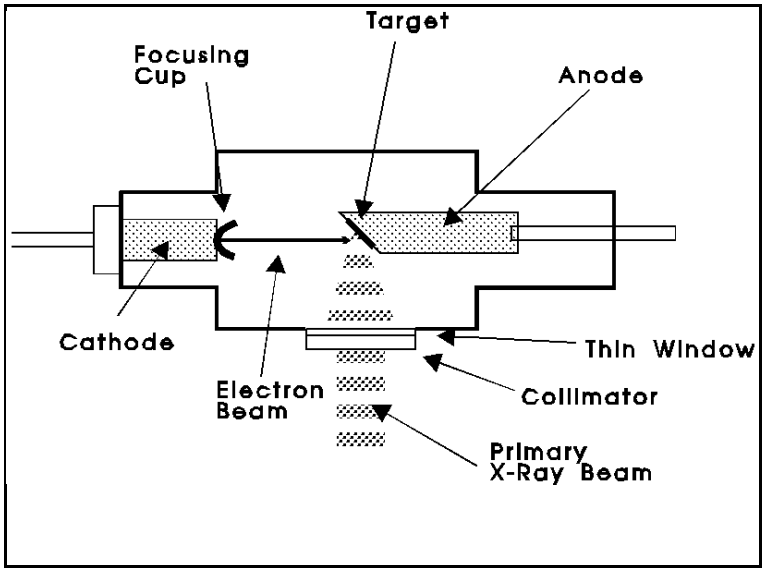
Abdul BenZikri, UW Health Physicist, has pre- pared a training outline manual for Principal Investigators to use as a guide when they train radiation workers. It should be available free from UW-Safety sometime in November.

HEALTH PHYSICS CORNER

X-RAY MACHINES

Historical Background

X-rays were discovered in 1895 in Würzburg, Bavaria by Wilhelm Konrad Roentgen. Roentgen discovered this penetrating new energy while exploring the properties of an electron dis charge, or cath ode ray tube. He noticed the ef- fects of some sort of radiation



outside of a black cardboard tube he had wrapped around the elec tron tube. He correctly de- duced that it was a product of in- teraction of the electron beam and the wall of the tube. He named this new radia tion X-ray. X-rays were used in Vienna to assist in surgery within three months of their discov ery. X-ray producing machines are now used for a wide variety of applications including medical and industrial radiography, crystallography, and spectroscopy.

Design and Function

Machines used to produce X-rays are composed of three main parts: The cathode generates and focuses the electron beam, usually by applying a high voltage current to a wire filament. The electrons are accelerated by a difference in potential between the source and the target. The anode is the target for the electron beam. It is usually made of a dense metal, often tungsten. X-rays are produced when the electron beam hits the anode.

The envelope is the "casing" for the machine, usually made of glass or beryllium. It supports the cathode and anode, contains the vacuum through which the electron beam travels, and provides the window through which the usable beam passes.

Safety

Unlike radiation produced by ra- dioactive mate- rials, X-rays stop generating when the X-ray producing ma- chine is deactivated. Wear your dosime- ter when operat- ing an X-ray ma chine. Wear lead aprons, leaded glasses, and thy roid shields; or use portable leaded whole body shields for procedures that require you to be present in the room when X-rays are generated using radiographic and/or fluoro scopic X-ray machines. Personnel who use X-ray diffraction machines should read the booklet titled "Fundamentals of Radiation Safety And Safety Guidelines For Individuals Utilizing Analytical X-Ray Equipment". When applicable, minimum room shielding requirements are based on peak X-ray tube potential and weekly workload modified by a use factor and an occupancy factor. Regulations concerning X-ray installa- tions can be found in Wisconsin Administrative Code, Radia tion Protection, HSS 157 and NCRP 49.

Disposal

Before you dispose of an X-ray machine, there are three things you should do:

1) Render the X-ray tube inoperable to prevent accidental or intentional misuse.
2) If the machine was made before 1978, contact Luis Fernandez at 3-8982 to determine if it contains PCBs
3) Contact Safety so that we can update our inventory and for annual registration fees.

If you have questions, call Arne Jansen at 2-8081.

ERRATA:In the May 1992 issue of Radia- tion Review, the date for the new 10CFR20 to go into effect was reported as January 4, 1994. The correct date is Janu- ary 1, 1994.

RADIONUCLIDE LAB SERVICES

The school of Veterinary Medicine Radionuclide Lab performs *radioimmunoassays for as low as $5.00 per sample (depending upon material cost and assay difficulty) on over 30 substances, including areas related to fertility, drug testing, thyroid function, adrenal function, cardiovascular function, and diabetes. Additionally, I-125 labelling of peptides is performed for $200.00 per 200+ µCi. Iodination options include lactoperoxidase, chloramine-T, and Bolton-Hunter reagent. RIA and iodination consultation and training are available on a low or no cost basis.*

Call Dr. Mark Brownfield (263-5863) or Joel Armstrong (263-4908) for additional informa tion.

FROM SCHOOL OF VET MED

If you are not currently receiving a copy of Radiation Review and would like to, please fill out the following and drop it in campus mail to the Safety Department or send the same information over e-mail to rnorth@macc.wisc.edu on internet or Ralph North on FPMN1.

Your Name _____ **Your** **Authorized User**_____

Your Campus Mailing Address_____ **No. of Copies**_____

WASTE WATCHERS

LABORATORY WASTE CONTAINERS

Please be sure that your solid radioactive waste containers could in no way be mistaken for normal trash containers. Mark all waste containers with "Caution Radioactive Materials" stickers on all sides and tape. We will supply you with stickers, and advise you where you can purchase tape. You can never overlabel a waste container. Whenever possible, keep your solid waste containers together in a well-marked section of your labo- ratory. When not in use, cover with a well-marked cover e.g. rad stickers, "DO NOT EMPTY"

SAFETY TRAYS

There are several safety trays for laboratory work on the market. We encourage the use of these trays as an alternative to absorbent paper or "lab diapers" for several reasons:

1) They are easy to clean. Many come with dis- posable liners. If something is spilled, or if the liner becomes contaminated, they can simply be removed and disposed as radioactive waste.
2) Spills are retrievable. If you spill a valu able experiment, you can pipette or aspirate some or all of it off the tray. If you were using absorbent paper, it would be lost.
3) Waste volume would be reduced. Much of the volume of radioactive waste we receive is absorbent benchtop paper. At the end of this year, two of the three low- level radioactive waste disposal sites in the United States will become un available to UW-Madison. An essential part of our strategy for managing radioactive waste must be to decrease the volume of waste generated from each laboratory.

UW-Safety Dept.
317 N. Randall Ave.
Madison, WI 53715

(608)262-8769