



University of Wisconsin-Madison

SAFETY IS OUR CONCERN...

SAFETY DEPARTMENT
317 N. Randall Avenue
MADISON, WISCONSIN 53715
608 262-8769 - 262-0667

July 23, 1984

Dr. Bruce Mallett
Division of Fuel Cycle and Material Safety
Nuclear Regulatory Commission
799 Roosevelt Rd.
Glen Ellyn, IL 60137

Dear Dr. Mallett,

We wish to renew License Number 48-09843-33. All information in the application dated March 26, 1979, amended by application dated June 5, 1979; and letters dated November 1, 1979, March 9, 1982 and February 16, 1984 (with attachments) is current, with the following exceptions:

- A. In the application dated March 26, 1979, item 12 should be changed to read "TLD Badges to be exchanged monthly or quarterly as required. TLD service is currently supplied by R.S. Landauer, Jr. and Co. on a biennial contract basis. The supplier may change at the end of a contract period."
- B. Attachments #10 (HEALTH PHYSICS INSTRUMENTS) and #11 to the March 26, 1979 application have been revised. The revised versions are attached.
- C. A revised expository page for Attachment #14 of the March 26, 1979 application is attached. A revised chart showing the administrative organization of the Safety Department is included as Attachment #14 A. New operating procedures and emergency phone list are included as Attachments #14 B and 14 C.

Please contact me if you need more information about this application.

Sincerely,

Sue Engelhardt

Sue Engelhardt
Health Physicist Supervisor

RECEIVED BY LFMB	
Date	7/30/84
Log	July 26th
By	PR
Orig. To	PR
Action Compl.	

FEE EXEMPT

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REG3 LIC30
48-09843-33 PDR

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Control No. 77167

ATTACHMENT B10

Health Physics Instruments

Geiger tube and ionization chamber survey meters; laboratory monitors; and gamma, beta, and neutron detection and measurement systems are available from many persons on campus. There is no exact accounting available for actual numbers. Health Physics Instruments available are:

Number	Instrument	Type of Radiation Detected	Range	Window Thickness	Use
1	Eberline Gas Proportional Alpha Counter Model PAC-46	alpha probe beta probe Tritium probe	0-500 cpm 0-500 cpm 0-500 cpm	0.85 mg/cm ² 0.85 mg/cm ² zero	Surveying and Measuring
16	Eberline GMS Model E-120	alpha, beta, gamma	0-50 mr/hr	1.4 mg/cm ²	Surveying
10	HP-190 End Window Probes				
6	HP-210 Pancake Probes				
1	Victoreen-Low Energy Survey Meter Model 440	alpha, beta, gamma, x-rays	0-300 mr/hr	1.0 mg/cm ²	Surveying
1	Victoreen-R/F Shielded Low-Energy X-ray Survey Meter Model 440RF/A	beta, gamma x-rays	0-300 mr/hr	Internal mylar 1.0 mg/cm ² External 0.005" magnesium	Surveying
1	Atomic Accessories Inc. - Tritium	alpha, beta	0-30,000 mCi/m ³ Tritium	None	Monitoring
1	Eberline Rad Owl - 1	alpha, beta, gamma	0-500 R/hr	1.7 mg/cm ²	Surveying
1	Eberline MS-1 & FC-1 Gas Flow Counter	alpha, beta	0-10 ⁵ cps	0-0.9 mg/cm ²	Measuring
3	Xetex 305B Digital Ratemeter	beta, gamma, x-ray	0-99.9 R/hr		Surveying
2	Xetex 409A Digital Dosimeter	gamma, x-ray	0-9999 mR		Surveying

(continued)

ATTACHMENT B10

Health Physics Instruments (continued)

Number	Instrument	Type of Radiation Detected	Range	Window Thickness	Use
3	Canberra MCA Model 3100	gamma, x-ray	0-10 ⁵ cps	147.9 mg/cm ²	Measuring
2	2" x 2" NaI well &				
1	3" x 3" NaI well				
2	2" x 2" NaI solid				
2	Packard Liquid Scintillation Counters	beta	0-3x10 ⁵ cps	-	Measuring
3	Victoreen 470A "Panoramic"	alpha, beta, gamma	0-10 ³ R/hr	17-500 mg/cm ²	Measuring
1	Eberline PRM-6 with LEG-1 Probe	gamma, x-ray	0-5x10 ⁵ cpm	75.4 mg/cm ²	Surveying
1	Eberline PRS-1 "Rascal"	alpha, beta, gamma, neutrons	0-10 ⁵ R/hr 0-10 ⁵ cpm	Various	Surveying and Measuring
1	Eberline 6112 B Teletector	beta, gamma	0-10 ³ R/hr	30 mg/cm ²	Surveying
1	Eberline RD-5B Digital Ion Chamber	alpha, beta, gamma	0-999.9 mR/hr	1.7 mg/cm ²	Surveying
1	Eberline PHR-4	neutron	0-5 Rem/hr	-	Measuring
1	TM Analytic 1191 Automatic Gamma Counter	gamma, x-ray	0-8x10 ⁵ counts	-	Measuring
1	Narda Microline 8100	Electromagnetic Radiation Monitor with Probes: 8122 A (200 mR/cm ²) 8121 A (20 mR/cm ²) 8120 A (2 mR/cm ²)			

ATTACHMENT #11

Calibration of Instruments Listed on Attachment #10

Members of the health physics staff calibrate health physics survey instruments using three Cs-137 sources. A source manufactured by 3M, with a nominal activity of 1.0 Curie, is located at the Safety Department. The other Cs-137 calibration sources are contained in a J.L. Shepherd Model 78-2M dual source irradiator. The nominal activities of the sources are 130 Curies and 1.3 Curies.

The dual source irradiator has an NBS traceable calibration from J.L. Shepherd which has been verified using NBS calibrated ion chambers. The activity of the 3M source has recently been verified using a 100 cc. ion chamber calibrated using the J.L. Shepherd sources. Decay correction for the Cs-137 source will be done at least semiannually.

The 3M source gives exposure rates from 0.07 mR/hr to 264 mR/hr using filters with transmission factors from 0.001 to 1.0 and changes in distance. The J.L. Shepherd irradiator has exposure rates from 11 mR/hr to 316 R/hr through use of the two sources and changes in distance.

The instruments will be calibrated at least annually at two points on each scale, separated by at least 50% of the full-scale reading.

ATTACHMENT #14

RADIATION PROTECTION PROGRAM

Attached is an organizational chart for the Safety Department, including the health physics staff.

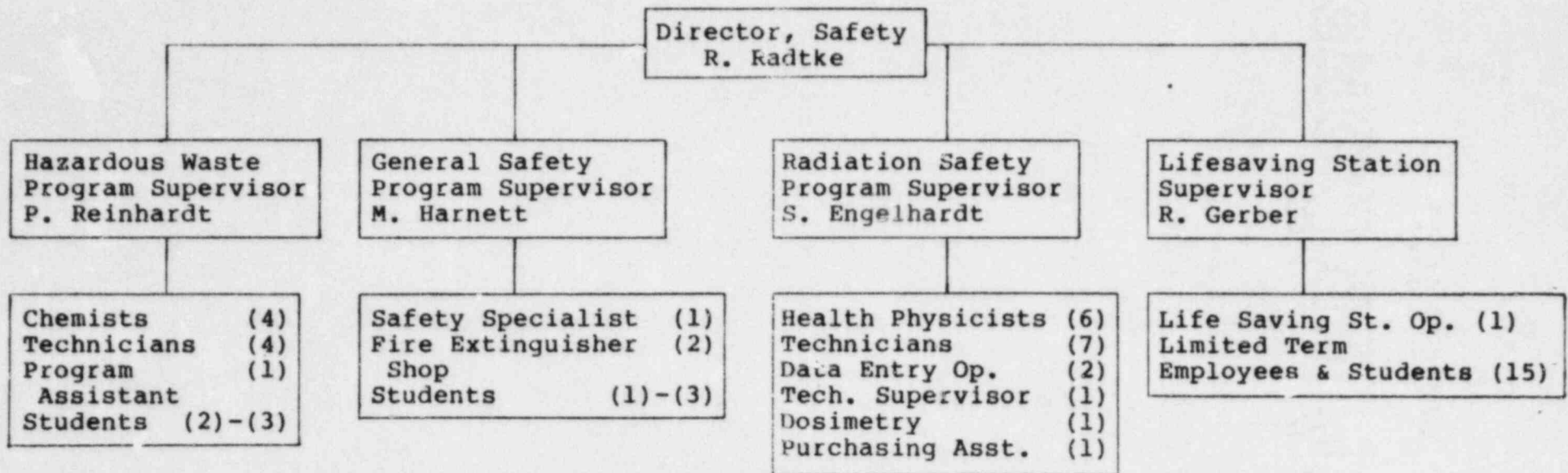
The individuals named in license condition 12 will ensure that use of the "Caesatron" is restricted to authorized persons by maintaining control of the console room key.

Operating procedures will be those submitted as Attachment 14 B in this renewal application. Emergency procedures are as submitted in the application dated March 26, 1979, but a new emergency phone list is included as Attachment 14 C with this renewal application.

Members of the health physics staff will test the source for leakage semiannually. A wet wipe of the source, or an appropriate accessible surface of the source container, will be taken. The wipe will be counted using instrumentation capable of detecting 0.05 microcurie of activity. Interlocks and warning lights will be tested whenever leak tests are done. These tests will be documented in a unit log book.

Any servicing, repair or source replacement will be done by the manufacturer or persons authorized by the NRC. Following any servicing, repair or source replacement, a radiation safety survey will be conducted and documented by or under the direction of the University Health Physicist.

To become authorized to use the "Caesatron", individuals will be required to follow the procedures described in the letter of November 1, 1979. A list of individuals authorized to use the "Caesatron" and documentation of training will be maintained.

ORGANIZATION OF SAFETY AT U.W.

The Safety Department is a part of the Physical Plant Services for the UW-Madison Campus.

Operation:

- 1) Check to confirm that you are wearing a TLD badge or any dosimeter assigned to you.
- 2) If the unit is already on (as indicated by the key in console, red beam-on light), a sign on the control panel should provide information as to the current operator. Consult this person for further information. In the absence of any information on the current user, the irradiation may be terminated.
- 3) If the unit is not on, insert the console key into the proper location on the control panel. The green light on the console should light (Master switch must be in "on" position).
- 4) Enter the irradiator room checking the lights on the "Caesatron" (red indicates beam-on) and the ratemeter to be absolutely certain that the beam is off. Make field size and material position adjustments as necessary. Close the door to K4/358C after exiting.
 - a) Make certain the beam collimator is in position. Do not operate without collimator.
- 5) Set timer for desired exposure duration and turn-on to initiate exposure. Check beam-on light on console and warning light above K4/358C door to be certain that source is now in the "on" position.

For short irradiation periods (less than an hour)

- a. Set desired time on 55 minute timer. Do not turn timer switch on.
- b. Set cumulative time indicator to 0.
- c. Set timer toggle 1 hour position.
- d. Push reset button.
- e. Set timer toggle to 55 minute position.
- f. Turn on 55 minute timer switch.
- g. Red light should go on, and green light off. Red safety light over door should flash as long as beam is on.

For longer radiation exposures, after positioning material, etc.

- a. Turn on master switch.
 - b. Set cumulative time indicator to 0.
 - c. Be sure 55 minute timer is at 0 and switch is off.
 - d. Set desired time on 12 hour timer.
 - e. Put timer toggle to "1 hour timer" position.
 - f. Push reset button.
 - g. Switch timer toggle to 12 hour timer.
 - h. Red light should come on and etc., as above.
- 6) In the event that you must leave the console room during an irradiation, fill out and post a copy of the attached sign on "Caesatron" control panel. Be certain that K4/358 is locked if you leave during an exposure.
 - 7) Before entering the irradiator room upon completion of the exposure, check the console lights and the warning lights above the door. Check the lights on the "Caesatron" and the ratemeter as you enter the room to confirm that the beam is off.
 - 8) Return the console key to Dr. D. Werts or Dr. M. Gould upon completion of the irradiation.

NOTIFICATION IN CASE OF RADIATION EMERGENCYHealth Physics Staff

	<u>Office Phone</u>	<u>Home Phone</u>
M. Baumann (Health Physicist)	262-8769/0667	837-4589
J. Lorenz (Health Physicist)	262-8769/0667	238-7432
G. Polando (Health Physicist)	262-8769/0667	
D. Kaiser (Health Physicist)	262-8769/0667	271-1846
E. Boeldt (Health Physicist)	262-8769/0667	249-7825
A. Ben-Zikri (Health Physicist)	262-8769/0667	238-1663
S. Engelhardt (Health Physicist Supr.)	262-8769/0667	244-1811
R. Radtke (Safety Director)	262-8769/0667	873-9639

Police and Security

262-2957

(Call if you cannot reach Health Physics Staff)

University Radiation Safety Committee Members

F. H. Attix (Prof. Human Oncology)	262-3527	273-0520
R. D. Bremel (Prof. Dairy Science)	263-5652	238-2746
R. H. Burris (Prof. Biochemistry)	262-3042	233-5932
P. M. DeLuca (Assoc.Prof.,Radiology)	873-6651	274-1842
S. J. Engelhardt (Health Physicist Supr.)	262-8769/0667	244-1811
P. A. Helmke (Prof. Soils)	263-4947	835-7059
L. Kahan (Prof.,Physiolog. Chem.)	263-1864	238-4394
F. C. Larson, M.D. (Prof. Medicine)	263-7507	251-1392
R. E. Polcyn, M.D. (Prof. Human Oncology)	256-1901 Ext.561	546-5891
R. R. Radtke (Safety Director)	262-8769/0667	873-9639
B. R. Thomadsen (Asst. Prof. Human Oncol)	263-8500	233-3438
W. F. Vogelsang (Prof. Engineering)	262-3374	271-1417

Medical Center Radiation Safety Committee Members

S. J. Engelhardt (Health Physicist Supr.)	262-8769/0667	244-1811
M. Garvin (Hosp. Safety Dir.)	263-1512	
R. H. Laessig (Dir. State Lab of Hygiene)	262-1293	238-3034
F. C. Larson, M.D.(Prof. Medicine)	263-7507	251-1392
W. S. Mellon (Asst. Prof. of Pharmacy)	262-3196	274-6061
R. J. Nickles (Prof. Radiology)	263-4269	231-3391
E. D. Plotka (Marshfield Clinic)	(715)387-5134	
R. R. Radtke (Safety Director)	262-8769/0667	873-9639
E. E. Seavey (Assoc, Dir. Animal Care)	263-6465	833-2130
B. R. Thomadsen (Asst. Prof. Human Oncol.)	263-8500	233-3438
G. J. Weir, Jr. MD (Marshfield Clinic)	(715)387-7787	
A. L. Wiley (Prof. Human Oncology)	263-8500	
M. A. Wilson, MD (Asst. Prof, Radiology)	256-1901 ext.562	
R. D. Woodson, MD (Prof. Medicine)	263-4916	233-8965
J. R. Cameron (Advisor to Committee)	262-9513	238-2544

If Medical Attention is Needed

Dr. F. C. Larson	263-7507	251-1392
Dr. R. E. Polcyn	256-1901 ext.561	546-5891
Dr. J. C. Puletti	263-8500	233-5004
Dr. M. A. Wilson	256-1901 ext.562	274-8342

Reactor Laboratory

R. Cashwell (Prog. Supr. Engr., Nuc. Eng.)	262-3392	831-6742
M. Jensen (Specialist, Nuc. Engr.)	262-3392	244-8545
D. Legare (Specialist, Nuc. Engr.)	262-3392	244-4265
S. Matusewic (Specialist, Nuc. Engr.)	262-3392	832-6264
W. Vogelsang (Professor, Engineering)	262-3374	271-1417