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February 5, 1997

Staffed by physicians of the
Medical College of Wisconsin.
Member, Horizon Healthcare Inc.

U.S. Nuclear Regulatory Commission
Region III
ATTN: Administrator
801 Warrenville Road
Lisle, Illinois 60532-4351

Re: License number 48-04193-01

Dear Administrator:

This correspondence is to comply with 10 CFR 20.2201 "*Reports of theft or loss of licensed material*". The telephone report was made on January 8, 1997 to the NRC Operations Center, within 30 days after it became known that the licensed material was missing. The ensuing written report is included as Attachment I.

If you require additional information or assistance, please contact Ralph Grunewald, Ph.D., Radiation Safety Officer at (414)257-6540.

Sincerely,

Charles W. Runge
Vice President of Clinical Services

cc: William Hendee, Ph.D.
B. David Collier, M.D.

ATTACHMENT I

WRITTEN REPORT TO NRC, PER 10 CFR 20.2201(b)(1)(i) to (vi)

- (i) A description of the licensed material involved, including, quantity, and chemical and physical form.

The missing radioactive material (RAM) is Iodine-125 (I-125) labeled protein, specifically, (3-[¹²⁵I]iodotyrosyl)α-Bungarotoxin, 90 microcuries, as a liquid aqueous solution in a glass bottle, inside a 2 inch outside diameter by 3.5 inches high cylindrical dark blue plastic container.

- (ii) A description of the circumstances under which the loss or theft occurred.

On December 6, 1996, the RAM was received from Amersham and delivered by the radiation safety staff to Dr. Earl Godfrey's laboratory, room 423, located within the controlled zone on the fourth floor of the D-Wing of the Medical College of Wisconsin (MCW) and accepted by the laboratory technician. Earl Godfrey, Ph.D. is a member of the Medical College of Wisconsin (MCW) faculty. MCW consists, in part, of research facilities located within the 6 floors of the D-Wing, the Medical Education Building (MEB), Macc Fund Research Center (MFRC), and Allen-Bradley Medical Science Laboratories (ABMSL). These facilities are interconnected.

On December 9, 1996, Dr. Godfrey started an experiment where the RAM was used to test a cellular biology experimental result, analogous to the use of an RIA test. Dr. Godfrey withdrew 10 microcuries out of the stock bottle containing 100 microcuries of the I-125 labeled protein and placed the stock bottle back into the blue plastic container it had arrived in from Amersham. He was also storing some photographic emulsion in the refrigerator used to store the RAM. Since he did not want to store the stock bottle of RAM in the refrigerator with the photographic emulsion, he decided to store the RAM in a cold room, room 421E. Room 421E is a small cold room within the controlled zone on the fourth floor of the D-Wing of MCW. The cold room was recently returned to service after the compressor was replaced. The cold room was not on Dr. Godfrey's authorization. As the cold room was now functional, he was going to request authorization to include room 421E. Room 421E was not locked from December 9, 1996 through December 11, 1996. The blue plastic container with the RAM and a thermometer were the only items reported to be in room 421E on December 9, 1996.

Dr. Godfrey checked room 421E, on December 10, 1996 confirming that the blue container was present. When he went to room 421E to get the container on December 11, 1996 at about 4 p.m., the blue container with the RAM was not present. On December 11, 1996 at about 4:30 p.m. Dr. Godfrey reported to the MCW Office of Radiation Safety(ORS) that the RAM was missing from the cold room, room 421E.

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Since the cold room was recently returned to service, Dr. Godfrey requested that the room be cleaned. The cleaning was performed on December 11, 1996 between 1 p.m. and 2 p.m. by contract custodial service personnel.

- (iii) A statement of disposition, or probable disposition, of the licensed material involved.

The probable disposition of the RAM is that it is somewhere within the research laboratory areas of MCW or that it has been inadvertently discarded. Dr. Godfrey is the only researcher that has been using the I-125 labeled protein.

- (iv) Exposures of individuals to radiation, circumstances under which the exposures occurred, and the possible total effective dose equivalent to persons in unrestricted areas.

Actual radiation exposure probably will not occur.

If the source was considered a point source, the exposure from 90 microcuries is 0.006 mR/hr at 1 meter based on gamma radiation levels listed in the "Radiological Health Handbook", revised edition, January 1970. Background radiation levels in this area are typically 0.02 mR/hr. With the RAM in the container, the exposure outside the container, from the RAM, would be much less than 0.006 mR/hr.

For a worst case scenario, if the RAM was ingested by an individual the following exposures are calculated for I-125 as iodide ion based on radiation dose estimates listed in NUREG/CR-6345. The effective dose equivalent for 90 microcuries is 2.16 rem. The thyroid dose is calculated at 70.2 rad. For protein bound iodine-125 the exposures would be less than those above.

- (v) Actions that have been taken, or will be taken, to recover the material.

On December 11, 1996, after reporting the RAM missing, Dr. Godfrey searched his laboratories and the surrounding area. On December 12, 1996, the search for the missing RAM was expanded considerably and enhanced by the assistance of the MCW ORS safety staff and many others. The search effort continued until January 8, 1997 when the event was reported as per 10 CFR 20.2201(a)(1)(ii) and (2)(ii) via telephone to the NRC Operations Center.

On December 12, 1996 the ORS staff searched Dr. Godfrey's laboratories and the surrounding area. The department had a regularly scheduled meeting at 11 a.m. and the RSO made a presentation at the start of the meeting defining the potential severity of this event and requesting the entire department to assist, initially to search their own space for the missing blue container. A theft report was submitted to security that afternoon. The Facilities staff assisted in arrangements and interviewed custodial staff. The custodial staff that cleaned the room on December 11, 1996 stated that the room was empty and that no trash was removed. Arrangements were made to hold the compactor-dumpster that collects the waste from the MCW complex.

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After December 12, 1996 and until January 8, 1997 the effort to locate the RAM was undertaken in essentially the following order:

Equipment located on the fourth floor with doors that could be opened, such as refrigerators or storage cabinets, were searched inside, outside and underneath. The ice making machine located next to 421E was emptied. The recycling containers for paper and for bottles were emptied. Each of the fourth floor laboratories were entered and selectively searched including opening drawers, refrigerators, cabinets, containers, etc., except faculty offices and department offices. The department office staff were informed of the missing RAM.

All the fire control cabinets from the first floor through the sixth floor of the D-Wing were checked by opening each of the four doors on each cabinet. All devices in the hallways with doors, drawers, or that could be readily opened were searched on the first, second third, fifth and sixth floors of the D-Wing.

On December 9, 1996 an empty compactor-dumpster was put in place at MCW by BFI, the contractor that removes the accumulated solid waste. By December 13, 1996 the dumpster was filled. It was replaced and the full dumpster parked next to the loading dock area, waiting to make plans to examine the contents. On December 19 and December 20, 1996 the entire contents of the dumpster were examined at a BFI transfer station. Each receptacle, box, bag, etc., were opened and the contents dumped to be able to see the blue plastic container.

The roofs of the D-Wing and MEB were searched. The periphery of the MCW complex, consisting of the MEB, D-Wing, MFRC, and ABMSL, were searched.

Fire exit stairwells on the west side of the D-Wing were searched. These stairwells are for emergency exit only. The doors are locked to prevent entrance to any floor and the outside exit door is equipped with an alarm.

The fourth floor hallways of the D-Wing have suspended ceilings at about 8 feet above the floor. The entire length of each hallway was searched by lifting the ceiling tile and physically looking into the space above the ceiling.

No dry radioactive or decayed waste was incinerated after December 9, 1996. Two freezers with biological waste containing partially decayed radioactive microspheres were incinerated after December 11, 1996. The freezers are located in radiation safety secured space.

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The radioactive waste that had been accumulated in the research laboratories using any RAM was collected from the D-Wing, MEB, ABMSL, and MFRC, and processed to examine the contents for the missing blue container.

Numerous contacts were made to MCW personnel by the radiation safety staff throughout the research laboratories area discussing the incident and requesting information.

On January 3, 1997, signs were posted at all D-Wing entrances, elevator, etc., asking for assistance from anyone who might have information regarding the disposition of the missing RAM. None was forthcoming.

Security conducted an independent investigation of the incident.

More than 500 person hours were expended in the attempt to recover the missing RAM, however, it was not found.

- (vi) Procedures or measures that have been, or will be, adopted to ensure against a recurrence of the loss or theft of licensed material.

The Radiation Safety Committee(RSC) held a special meeting on December 20, 1996 to consider the incident of the missing RAM. The committee action was to have the ORS staff remove all RAM from Dr. Godfrey's laboratory. For a minimum of six months (December 20, 1996 until June 20, 1997) he may use RAM that he is authorized to possess in quantities no greater than 10 times the quantities listed in Appendix C of 10 CFR 20. The Radiation Safety Committee will review his status at the next regularly scheduled meeting following the six month time period.

Authorized users will be made aware of the consequences of this incident in various ways, including inservice presentations, audits, memos, etc.

Continued review of this incident will be an agenda item for the next several RSC meetings.

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