

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

INSPECTION REPORT

Inspection No. 03001317/2010001
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License No. 08-01738-02
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NMED No. 100223
Licensee: Department of the Army
Walter Reed Army Medical Center
Location: 6900 Georgia Avenue, NW
Washington, D.C. 20307-5001
Inspection Dates: May 26, 2010 and August 5, 2010 (exit meeting)
Date(s) Followup
Information Submitted: June 14, July 9, 13, 16, and 22, 2010

Inspectors:	/RA/	08/05/10
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EXECUTIVE SUMMARY

Department of the Army
Walter Reed Army Medical Center
NRC Inspection Report No. 03001317/2010001

An announced, reactive inspection was conducted at Walter Reed Army Medical Center (WRAMC) in Washington, D.C. on May 26, 2010 to review the circumstances surrounding a temporary loss of control of radioactive material (RAM) that was reported (NRC Event Notification 45894) by WRAMC to the NRC on May 3, 2010. An in-office review to evaluate the event and WRAMC's corrective actions continued through August 5, 2010. Specifically, the event involved the loss of control of two packages containing 1.541 curies of molybdenum-99 and 74.5 millicuries of thallium-201 for approximately 44 hours. The packages were delivered on May 1, 2010, and were accepted by the concierge on duty who stored them under the concierge counter in the main hospital lobby (a controlled, but unrestricted, area). The intended recipient, the Administrative Officer of the Day (AOD), recognized on May 1, 2010 that WRAMC had not received the expected delivery and unsuccessfully attempted to determine the status of the package delivery that day. On May 3, 2010, the next routine workday, Nuclear Medicine personnel continued with their search and were able to successfully locate and properly store the RAM packages.

WRAMC performed an evaluation of this event and determined that at the time the packages were received and stored under the concierge counter, the dose rate at the closest concierge workstation was 2.06 millirem per hour and the dose rate at the closest surface of the uncontrolled area in the walkway outside the concierge desk was 18.56 millirem per hour. WRAMC conservatively estimated the maximum dose to WRAMC personnel assigned to the concierge and AOD areas to be 46.8 millirem and the maximum dose to members of the public in the waiting area to be approximately 1 millirem.

WRAMC's evaluation of this event concluded that the concierge on duty did not follow WRAMC policy for RAM package receipt and WRAMC did not have adequate procedures for response to potentially missing RAM packages.

Based on the results of this inspection, two apparent violations of NRC requirements were identified. Specifically, WRAMC did not control access to 1.541 curies of molybdenum-99 and 74.5 millicuries of thallium-201, as required by 10 CFR 20.1802; and WRAMC did not conduct operations so that the dose in an unrestricted area from external sources does not exceed 0.002 rem (2 millirem or 0.02 millisievert) in any one hour, as required by 10 CFR 20.1301(a)(2).

REPORT DETAILS

I. Event Description

a. Inspection Scope

An announced, reactive inspection was conducted at Walter Reed Army Medical Center (WRAMC) in Washington, D.C. on May 26, 2010 to review the circumstances surrounding a temporary loss of control of radioactive material (RAM) that was reported (NRC Event Notification 45894) by WRAMC to the NRC on May 3, 2010. Specifically, the event involved the loss of control of two packages containing 1.541 curies of molybdenum-99 and 74.5 millicuries of thallium-201 for approximately 44 hours. The inspectors conducted interviews with WRAMC personnel, reviewed WRAMC documents and procedures related to receipt of packages, reviewed WRAMC's dose calculations, and toured the WRAMC facility. An in-office review to evaluate the event and WRAMC's corrective actions continued through August 5, 2010.

b. Observations and Findings

Event Chronology

WRAMC ordered a nominal 2 curie molybdenum-99/technetium-99m generator and three sources of thallium-201 to be delivered by the FedEx courier service at approximately 10:30 a.m. on Saturday, May 1, 2010. The Nuclear Medicine Department was closed for the weekend and the RAM was intended for patient use on Monday, May 3, 2010. This delivery day and method were different than WRAMC's standard practice and were necessary due to the worldwide shortage of molybdenum-99. The packages were intended to be accepted and signed for by the Non-Commissioned Officer in Charge of Nuclear Medicine, who was scheduled to work on May 1, 2010, as the Administrative Officer of the Day (AOD) for the entire WRAMC facility.

On May 1, 2010 in preparation for the arrival of the packages, the AOD posted signs on the doors to the Nuclear Medicine Department directing that any packages should be delivered to the AOD at the AOD/concierge desk in the lobby of the first floor of the main hospital. The AOD took a break sometime between 11:30 a.m. and 1:00 p.m. FedEx tracking records show an initial attempted delivery at 11:51 a.m. and delivery at 12:49 p.m. The packages were accepted by the concierge on duty, contrary to WRAMC policy that only the AOD may accept packages. The concierge on duty stored the two packages underneath the front desk counter, and did not inform the AOD that the packages had been received or where they were stored. The inspectors noted that based on a re-creation of the event, the packages were obscured from view behind a large safe in the concierge area. The activity contained within the packages at the time of delivery was 1.541 curies of molybdenum-99 and 74.5 millicuries of thallium-201, with a combined exposure rate at time of delivery of 1.67 millirem/hour at 1 meter.

Later that afternoon, the AOD (unaware of the delivery) recognized that the expected packages had not been received, contacted a WRAMC nuclear medicine colleague and FedEx, and unsuccessfully attempted to contact the vendor. The inspectors determined

that, because the FedEx tracking number had not been provided to WRAMC and the AOD could not obtain it from the vendor, FedEx could not provide the delivery status to WRAMC personnel. At 5:00 p.m., FedEx informed the AOD that there were no remaining packages to be delivered to WRAMC that day. Based on that information, the AOD concluded that the expected packages had not been delivered.

On the morning of May 3, 2010 a WRAMC nuclear medicine technologist called the vendor, retrieved the tracking number, contacted FedEx at 7:40 a.m., and learned that the packages were delivered and signed for by the concierge on duty at 12:49 p.m. on May 1, 2010. Nuclear Medicine staff went to the AOD/concierge desk and found the RAM packages underneath the concierge counter, an unrestricted but controlled area. The packages were retrieved and taken to the Nuclear Medicine Department at 8:15 a.m., after being out of control for approximately 44 hours. Incoming package receipt surveys performed by WRAMC personnel at approximately 8:40 a.m. showed external radiation levels consistent with the transport indexes at the time of shipment and no significant removable contamination.

Notification of the Event

The Radiation Safety Officer reported the event to the NRC Headquarters Operations Center (Event Notification 45894) at 11:27a.m. on May 3, 2010 after being informed and performing an investigation of the incident. WRAMC submitted the required written report to the NRC and a revised report dated, May 6, 2010 and June 14, 2010, respectively. WRAMC's telephone notification and subsequent written report to the NRC for the loss of control of a nominal 2 curies of molybdenum-99 were in accordance with the requirements of 10 CFR 20.2201(a)(1). The actual quantity of molybdenum-99 at the time of delivery was determined to be 1.541 curies. The loss of control of 74.5 millicuries of thallium-201 did not meet the threshold for reporting.

Licensee's Dose Reconstruction

WRAMC's assessment showed that, at the time the packages were received and placed under the concierge counter, dose rates were 2.06 millirem per hour at the nearest concierge workstation to the packages, 18.56 millirem per hour at the closest surface of the uncontrolled area in the walkway outside the AOD/concierge desk, and 1.16 millirem per hour in the middle of this walkway outside the AOD/concierge desk (the most likely occupied location). The inspectors noted that WRAMC's dose calculations did not consider attenuation by intervening materials.

WRAMC performed dose estimates for 20 WRAMC staff members who worked in the AOD/concierge desk area between Saturday afternoon, May 1 2010 and Monday morning, May 3, 2010. WRAMC estimated a maximum dose of 46.8 millirem to the concierge on duty, a non-radiation worker who signed for the packages, and maximum doses ranging from 0.2 to 35 millirem for the other 19 staff members. These estimates were based on conservative assumptions (i.e., dose was calculated without decay correction, without consideration of attenuation by intervening materials, and assuming that each individual occupied the nearest workstation to the package for their job classification [3 feet for concierge staff and 13 feet for military personnel] for their entire

assigned work shift(s), without breaks). WRAMC also estimated a maximum dose to individual members of the public in the lobby waiting area of approximately 1 millirem. In addition to the maximum dose estimate, WRAMC performed a refined calculation to reflect a "more realistic" dose estimate for the concierge on duty who signed for the packages and estimated this to be 8.6 millirem. This calculation assumed that the concierge on duty was away from the desk for two of his 23.5 hours of duty time and was sitting at the center concierge workstation (2 meters from the packages) rather than at the workstation nearest to the packages.

Licensee's Corrective and Preventive Actions

WRAMC evaluated this event and concluded that the concierge on duty did not follow WRAMC policy for RAM package receipt and WRAMC did not have adequate procedures for response to potentially missing RAM packages. WRAMC described corrective and preventive actions in communications on May 6, June 14, July 9, 13, 16, and 22, 2010, including:

- (1) Reiterated and communicated to AOD and concierge personnel the WRAMC policy outlining who is authorized to sign for packages, including RAM packages.
- (2) Provided to all WRAMC RAM vendors detailed instructions regarding delivery of packages to WRAMC, including who may sign for packages.
- (3) Established a detailed procedure to track receipt of expected packages and steps to be taken if an expected package is not received.

c. Conclusions

Based on the results of this inspection, two apparent violations of NRC requirements were identified. Specifically,

- (1) 10 CFR 20.1802 requires that the licensee 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, WRAMC did not control and maintain constant surveillance of licensed RAM that was in a controlled or unrestricted area and that was not in storage. Specifically, from May 1 to May 3, 2010, the WRAMC did not maintain control of packages containing 1.541 curies of molybdenum-99 and 74.5 millicuries of thallium-201 when an unauthorized individual accepted the packages and placed them in an unrestricted area.

- (2) 10 CFR 20.1301(a)(2) requires that the licensee conduct operations so that the dose in any unrestricted area from external sources does not exceed 0.002 rem (2 millirem or 0.02 millisievert) in any one hour.

Contrary to the above, WRAMC did not conduct operations so that the dose in any unrestricted area from external sources did not exceed 2 millirem in any one

hour. Specifically, on May 1, 2010, WRAMC's operations resulted in a dose of 2.06 millirem/ hour at a workstation in the AOD/concierge desk and 18.78 millirem/hour at the closest portion of the uncontrolled area in the walkway outside the AOD/concierge desk in the lobby of the first floor of the main hospital.

The inspectors determined that WRAMC's telephone notification and subsequent written reports to the NRC of a nominal 2 curies of molybdenum-99 were in accordance with the requirements of 10 CFR 20.2201(a)(1). Loss of control of 74.5 millicuries of thallium-201 did not meet the threshold for reporting. None of the dose estimates to individuals exceeded the annual dose limit of 10 CFR 20.1301(a)(1) of 0.1 rem (100 millirem or 1 millisievert) for individual members of the public. Corrective actions taken by WRAMC appear to be adequate to prevent a recurrence of this type of event.

II. Exit Meeting

A preliminary exit meeting was conducted on May 26, 2010, to discuss the scope of the inspection and the inspectors' initial observations. On August 5, 2010, an exit meeting was held by telephone with COL John Gaal and other members of your staff to discuss the results of the inspection.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

*# LTC Hee-Choon Lee, Chief, Preventive Medicine
*# LTC Sidney R. D. Hinds II, Chief, Nuclear Medicine Service
*# MAJ Aaron Miaullis, Chief of Technical Services, Health Physics
*#+ MAJ Andrew Scott, Radiation Safety Officer and Chief of Operations, Health Physics
*# COL Felicia Pehrson, Deputy Commander for Clinical Services
*#+ COL John M. Gaal, Hospital Deputy Commander of Administration (Acting Hospital
Commander on August 5, 2010)
*+ David Burton, Chief of License Support, Health Physics
COL Norvell V. Coots, Hospital Commander
SGT James O. Ashcraft, Nuclear Medicine NCOIC
Robert Massi, Nuclear Pharmacist
Yvette Marquez-Sayer, Nuclear Medicine Technologist
Joy Peterson, Concierge
+ COL Thomas Burklow, Acting Deputy Commander for Clinical Services
+ LTC Derek Stocker, Acting Chief, Nuclear Medicine Service
+ MAJ Frank Fota, Chief, Health Physics Service

* Present at entrance meeting conducted on May 26, 2010

Present at preliminary exit meeting conducted on May 26, 2010

+ Participated in telephonic exit meeting conducted on August 5, 2010