

U.S. NUCLEAR REGULATORY COMMISSION

REGION V

EA 92-222
Report No. 92-01
Docket No. 030-03557

Licensee: St. Francis Medical Center
2230 Liliha Street
Honolulu, Hawaii 96817

Inspection at: St. Francis Medical Center, 2230 Liliha Street, Honolulu Hawaii 96817.

Inspector: Kent M. Prendergast 11/24/92
Kent M. Prendergast, Radiation Specialist Date Signed

Approved By: G. P. Yuhas 11/25/92
Gregory P. Yuhas, Chief Date Signed
Radioactive Materials Safety Branch

Summary:

Inspection on November 2, 1992 and November 18, 1992.

Areas Inspected: This was a special unannounced radiation safety inspection to determine the circumstances surrounding the disposal of about 400 microcuries of iodine 131 to an unrestricted area.

NRC inspection procedures 83822 and 92701 were used.

Results: On October 23, 1992, the licensee released waste materials contaminated with iodine 131 to the clean trash. The improper disposal resulted from human error and a lack of management oversight. Two apparent violations were identified. One violation involved a failure to perform adequate surveys of potentially contaminated material as required by 10 CFR 35.92. (Section 4). The other violation involved an unauthorized disposal of approximately 400 microcuries of iodine 131 in violation of 10 CFR 20.301 and License Condition 17. (Section 4).

DETAILS

1. Persons Contacted:

- *Sister Beatrice Tom, Chief Executive Officer
- *Edward Hew, M.D., Radiation Safety Officer
- *Winfred Y. Lee, M.D., Head of Nuclear Medicine
- *James Yano, Hospital Administration
- *Alvin Leong, Chief Nuclear Medicine Technologist
- Russel S. Takata, Supervisor, State Radiation Control Department
- *Indicates licensee personnel at the Exit Interview

2. Event Summary

On October 23, 1992, a shipment of waste from St. Francis Medical Center caused the radiation monitoring system at the H-Power Plant in Honolulu, Hawaii to alarm. After setting off the H-Power Plant's radiation alarms, the truck and waste container were diverted to the Waimanalo Gulch landfill. Department of Health and Fire Department HAZMAT teams were notified and responded. After being surveyed by the HAZMAT teams, the truck and container were escorted back to St Francis Hospital.

3. Licensee Actions

Based on discussions with the licensee's Radiation Safety Officer, the Chief Nuclear Medicine Technologist, the Supervisor of the State Radiation Control Program, and a review of documentation regarding the above mentioned event, the following were noted:

On October 23, 1992, following notification from the State Radiation Control Program, the Hospital RSO and Chief Nuclear Medicine Technician (CNMT) returned to the hospital and met with the Supervisor of the State Radiation Control Program. The truck was roped off as a restricted area and surveys were accomplished to determine the cause of the radiation alarms. The radiation level at the right rear portion of the truck read approximately 3 mR/hr. The RSO accompanied by the CNMT opened the truck's container and with the aid of survey meters identified a single intact sealed bag containing food trash and disposable dietary items from an iodine therapy patient's room. Once identified, the unopened bag was placed in the locked radioactive waste storage room for decay.

On Monday morning, October 26, 1992, with the aid of the hospital's health physics consultant, the RSO and CNMT surveyed the waste container and confirmed the radioactive contamination was confined to the bag of dietary items from the therapy patient. Surveys of

the remaining waste demonstrated there was no activity above background levels and the shipment was released for disposal.

The RSO and the consultant investigated the event and presented the following in their report: Section 1 described their response to the October 26, 1992, event; Section 2 described their assessment of the radiation exposure levels from the bag of contaminated trash. The licensee concluded the maximum exposure at 10 inches from the bag was 0.75 mR/hr on October 21, 1992. This radiation level is below the maximum radiation levels allowed by 10 CFR 20.105 of 2 millirem in any one hour or 100 millirem in one week; Section 3 provided their conclusion that the maximum amount of iodine 131 that could have been released was 210 microcuries; Section 4 reiterated the source of the radiation as being contaminated food trash from a therapy patient's room; Section 5 described their corrective actions to preclude recurrence and included the following:

- * The nuclear medicine technicians have been retrained regarding the proper methodology for performing surveys prior to releasing materials to unrestricted areas.
- * The procedures for releasing items from a therapy patient's room have been revised to include specifics on how to perform surveys prior to release.
- * In addition, a scintillation survey meter will be purchased and surveys will be performed on the waste container, prior to pickup by the trash hauler.

The hospital's corrective actions were discussed with Region V during an October 26, 1992, telephone conversation between the Hospital RSO and the NRC Chief, Radioactive Materials Safety Branch. Following this conversation the licensee's intended corrective actions were confirmed in an October 26, 1992, Confirmatory Action Letter (CAL).

4. NRC Assessment

On November 2, 1992, the NRC Inspector discussed the event with the Supervisor of the State Radiation Control Agency, the hospital RSO and Chief Technician. The inspector examined the hospital's documentation of the event. The inspector reviewed previous audits of radiation safety, the hospital procedures for the therapeutic use of radiopharmaceuticals, and procedures for decay and disposal of radioactive materials. The inspector also confirmed the hospital's corrective actions identified in the October 26, 1992, Confirmatory Action Letter. The following were noted.

- * 10 CFR 20.301, Waste Disposal, requires in part, that no licensee shall dispose of licensed materials except as authorized. During discussions with the CNMT, it was determined that on October 21, 1992, the licensee released about 400 microcuries of iodine 131 to

the normal hospital trash, a location that is outside the restricted area and not authorized under the license. The unauthorized disposal was responsible for setting off the radiation alarms at the H-Power Plant. The unauthorized release of iodine 131 represents an apparent violation of 10 CFR 20.301.

- * 10 CFR 35.315(a)(5), Safety Precautions, requires in part that for each patient receiving radiopharmaceutical therapy and hospitalized for compliance with 35.75, each licensee shall: "Either monitor material and items removed from the patients room to determine that their radioactivity cannot be distinguished from the natural background radiation level with a radiation detection survey instrument set on its most sensitive scale and with no interposed shielding, or handle them as radioactive waste."

License Condition 17 and the hospital's procedure entitled, Therapeutic Use of Radiopharmaceutical, requires in part that: "materials will be held until surveyed by the RSO or his designate to determine that their activity cannot be distinguished from background radiation level. Items greater than background will be removed to radioactive waste storage for decay."

The CNMT acknowledged that on October 21, 1992, he monitored the waste from a radiation therapy patient's room at one meter and recorded an elevated reading of 0.1 mR/hr. Following the survey, he released the container to the normal trash. He stated that he was aware that the 0.1 mR/hr was above background (background was about 0.05 mR/hr). However, he was unable to provide an explanation as to why he released the shipment to the trash, knowing the reading was greater than background. He stated that he may have used a survey meter in the past that only went down to 0.1 mR/hr. The failure after the survey to treat the contaminated items as radioactive waste was the apparent reason for the unauthorized disposal.

- * 10 CFR 35.92, Decay In Storage, exempts the licensee from the requirements of 20.301 provided: the licensee "monitors byproduct material at the container surface before disposal as ordinary trash and determines that its radioactivity cannot be distinguished from background radiation level..."

The CNMT stated that he had been performing surveys for disposal at one meter for many years. He stated he even trained the other technicians in this method. The CNMT recalled that he disposed of waste from the waste storage room, in this manner, on at least four occasions in 1992. He could not recall exactly why he performed the survey at one meter except to say, that he surveys incoming shipments of byproduct materials at one meter. The CNMT also stated that he may have become complacent regarding the requirements for the disposal of radioactive materials. The failure to survey the surface of

a container prior to disposal is an apparent violation of 10 CFR 35.92 and hospital procedures.

The inspector discussed technician training with the RSO. The RSO stated that he assumed the position of RSO at the end of 1988. He stated that he had not personally performed any training involving surveys for the release of radioactive materials. He assumed that personnel were trained and that all surveys for disposal were performed at the surface of the item to be disposed. He stated he was unaware that surveys for disposal were being performed at a distance of one meter.

The licensee's radiation safety audits for the previous two years were examined and no documentation was observed indicating negative findings involving surveys of waste prior to disposal. The RSO and the auditors had not physically observed this area or technical training in this area.

The NRC inspector visited the trash compactor and agreed with the licensee's assessment that the unauthorized disposal did not pose a threat to the health and safety of the public. The compactor was observed to be in a remote area and not normally occupied. Using standard calculations contained in the Bureau of Radiological Health Handbook (1970), and the exposure rate stated to be 0.1 mR/hr at one meter, the inspector calculated that about 400 microcuries were disposed on October 21, 1992. This result differs from the licensee's calculation, however this difference may be due to decay from the time of disposal or due to differences in instrument efficiency or geometry.

During the inspection, the NRC inspector confirmed the hospital's corrective actions as stated in the CAL. The CNMT and the other technicians involved in performing surveys of radioactive materials had been retrained to perform the surveys in a low background area and to perform the survey on all surfaces of the material to be disposed. The licensee was also noted to be revising their procedures to provide more details on survey methodology. In addition, to preclude any future problems in this area the hospital intends to purchase a scintillation detector to monitor all waste prior to pickup by the trash hauler. This instrument will also alert the hospital to a disposal of diagnostic radioactive material and preclude any further incidents.

Failure to properly perform surveys of potentially contaminated materials prior to release is an apparent violation of 10 CFR 35.92(a)(2) (90-01-01). Disposal of radioactive material in clean trash is an apparent violation of 10 CFR 20.301 (92-01-02).

5. Exit Interview

An exit interview was conducted by telephone on November 18, 1992. Personnel present at this meeting are identified in Section 1 of this report. During this interview the licensee was informed of the two apparent violations discussed in Section 4 of this report.