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Syncor International Corporation

June 5, 1997

U.S. Nuclear Regulatory Commission
Document Control Desk
11555 Rockville Pike
Rockville, MD 20852-2738

RE: NRC Event #32287 - Written Report Pursuant to 10 CFR 20.2203

Dear NRC Representative:

Enclosed is a written follow-up to NRC Event #32287 which was reported to Mr. Bob Stransky at the NRC Operations Center on May 7, 1997. The reported event was receipt of a package containing radioactive material with external surface contamination levels in excess of the limits in 10 CFR 20.1906. The package was shipped from Barnes-Jewish Hospital, Washington University Medical Center, St. Louis, MO, to Syncor International Corporation, St. Louis, MO, NRC License # 04-26507-01 MD, on May 6, 1997. The package was shipped as a Limited Quantity shipment, and was transported by Syncor.

The following is a summary of events regarding this incident. All times are Central Daylight Time unless otherwise specified.

May 6, 1997

2:50pm At 2:50pm, a Syncor Customer Service Assistant (CSA), left the Syncor St. Louis Pharmacy with a shipping package containing xenon-133 to be delivered to Barnes-Jewish Hospital at Washington University Medical Center. Prior to leaving with this delivery, the CSA was in the restricted area at the Syncor pharmacy and surveyed her hands and feet as she exited that area. When the CSA reached Barnes-Jewish Hospital, she delivered the package and picked up two other packages containing empty lead pigs. These two packages were labeled as Limited Quantity Shipments and were in the correct designated area for return pick up by Syncor.

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3:30pm The CSA arrived back at the Syncor pharmacy at approximately 3:30pm. She took the two packages from the car and placed them through the pharmacy door to the breakdown area (restricted area) without entering the restricted area. The CSA was then given a package to be delivered to Barnes-Jewish West County Hospital.

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4:15pm The CSA returned to Syncor at approximately 4:15pm, after delivering one package to Barnes-Jewish West County Hospital. At this time, the CSA performed her end-of-the-day survey.

The CSA performed a wipe test of her hands and placed the wipe into the Model 203 NaI well detector connected to a Ludlum Model 2200 Scaler, and counted it for 30 seconds. The wipe count rate was found to be approximately 50,000 cpm. Jim Horner, the pharmacist on duty, instructed the CSA to wash her hands in the sink using radiacwash. The CSA washed her hands approximately five times. She then rewiped her hands and counted the wipe with the same counting system. This wipe was found to be at background levels.

While the CSA was washing her hands, Mr. Horner telephoned Barnes-Jewish West County Hospital and spoke with Darlene, a nuclear medicine technologist. Mr. Horner asked her to check the package the CSA had recently delivered. Darlene had already performed a wipe test of the package which was found to be at background, but agreed to perform another. The second wipe of the package also was found to be at background levels.

After decontaminating her hands, the CSA surveyed herself using a Bicron 2000 survey meter with pancake GM probe. Two contaminated areas were found. One spot was found on her left hand approximately 2 mm under a finger nail. The area under the finger nail read about 249cpm at a distance of approximately 1cm from the probe. The second spot was approximately 1 square centimeter on the left rear pant leg under the pocket. This spot read 2400cpm at approximately 2cm from the probe. The CSA took her pants off and placed them into a plastic bag to be held for decay. After putting on a new pair of pants, the CSA surveyed herself in the same area on the leg that the original contamination was found. No levels higher than background were detected. It was later determined that the back of her pants were cross-contaminated by placing her left hand under her left leg while driving the car.

Mr. Horner took the two packages picked up from Barnes-Jewish Hospital at Washington Medical Center, and wiped both packages with one wipe. The area of the wipe is estimated at 600 cm^2. This wipe was counted for 6 seconds in the Ludlum Model 2200 Scaler with NaI crystal. The wipe count rate was found to be 1,292,510 cpm. Taking into account the detector efficiency, this corresponds to an activity of approximately 1,389,796dpm/600 cm^2 (not taking into account instrument dead time).

Mr. Horner then placed the wipe from the packages into the multichannel analyzer, a Nucleus Quantum 8, and identified the contamination as Tc-99m. He then surveyed each of the contaminated packages using the Bicron 2000 pancake GM probe with open face. One package was found to be 24,000cpm, and the second was found to be 36,000cpm.

Mr. Horner telephoned Barnes-Jewish Hospital and spoke with Bob Giback, a nuclear medicine technologist. Mr. Horner explained the contamination found on Syncor's CSA and told Mr. Gibach there was a possibility that the contamination originated in the Barnes-Jewish Hospital Pharmacy.

During the time Mr. Horner was speaking to the Barnes-Jewish Hospital, a Syncor pharmacy technician took wipe surveys of the car the CSA was driving. The single wipe taken of the steering wheel and stick shift knob was found to be 215,054dpm when counted on the Ludlum 2200 Scaler with NaI crystal. Using a pancake GM probe open window, the steering wheel was found to be contaminated. Another member of Syncor's staff decontaminated the areas with Windex and paper towels. After decontamination, all wipes taken in the car were at or below background levels. It was approximately 5:15pm when the car was decontaminated.

5:15pm Mr. Horner double bagged the two contaminated packages and placed them into a lead barrel for storage and decay. He took a wipe survey of the doorknob and keypads at the outside entrance to the building. Using the same counting instrument as before, the wipe was found to have 2440dpm. Using Windex and paper towels, he decontaminated the doorknob and keypad. The final wipe test was found to be 161dpm. He then took wipe surveys of the pharmacy floor in the breakdown area, floors near each exit, and the floor in the area where hand and foot monitoring is performed prior to exiting the restricted area. All wipes were less than 30 cpm above background. After wipe testing the floor, he also performed an area survey using a pancake GM probe using the open face. No levels above background were found. Wipe tests of the breakdown table, other packages, and tops to the breakdown barrels were also taken and found to be at background levels.

6:00pm Mr. Horner telephoned the Syncor St. Louis Pharmacy PRSO at home. He left a message, and the PRSO called him back at approximately 6:20pm. After 6:00pm, the Pharmacy Manager arrived at the pharmacy to finish some other work, and was then informed of the contamination incident. The PRSO asked Mr. Horner if the Quality and Regulatory Department (Q&R) at Syncor's Corporate Office had been notified, and

she found that notification had not yet been made. The PRSO called Q&R and left an urgent message for David Pellicciarini, Syncor's Health Physics Program Manager.

Mr. Pellicciarini called the pharmacy after receiving the message and spoke with the pharmacy manager. Mr. Pellicciarini determined that the event was immediately reportable to the NRC. He instructed the pharmacy manager to telephone the Barnes-Jewish Hospital to inform them that a report would be made by Syncor. The pharmacy manager could not reach anyone at the hospital at this time.

Mr. Pellicciarini phoned the NRC Operations Center at approximately 6:14pm PST. He spoke with Bob Stransky and related the events as he understood them at the time.

May 7, 1997

6:30am The PRSO opened the pharmacy at 2:00am the next morning. At approximately 6:30am she received a telephone call from Monte Philips from the NRC. Mr. Philips asked for additional information pertaining to the contamination incident.

6:45am Chris Fitz, Syncor Health Physicist, telephoned the PRSO at the pharmacy to get additional information about the incident. While they were on the phone, Charlie Trunk, pharmacist in charge of the nuclear pharmacy at Barnes-Jewish Hospital, also called the Syncor Pharmacy. Mr. Trunk was calling from home because he had received a phone call from Helen Kaemmerer, nuclear pharmacy technologist at Barnes-Jewish hospital, notifying him that the NRC had called her about the contamination incident. Syncor's PRSO placed Mr. Fitz on hold while she explained the events to Mr. Trunk. Mr. Trunk questioned how much activity was involved in the incident. The PRSO was unsure, so she placed him on hold and asked Mr. Fitz if he knew how much activity the contamination was. Mr. Fitz estimated the activity as approximately 0.6uCi (not accounting for detector dead time). The PRSO related this information to Mr. Trunk and said he should call her back if he had additional questions.

Mr. Fitz spoke to Mr. Horner after Mr. Horner had arrived at Syncor's pharmacy. Mr. Fitz asked him to ensure the CSA performed another wipe test and survey when she came into work that day at 11:00am. All wipes and surveys of the CSA were at background levels.

After speaking with Mr. Fitz, the PRSO got the contaminated packages

and took individual wipes. One package was several times more contaminated than the other. One package was approximately 160,000cpm and the other was approximately 1000cpm above background. The PRSO felt that it was possible that only one package was initially contaminated and the second package became cross-contaminated when the CSA picked them up.

8:00am Sally Schwartz, deputy RSO for the radiopharmacy at Barnes-Jewish Hospital, contacted Syncor's PRSO at approximately 8:00am. Ms. Schwartz asked Syncor's PRSO to verify certain information. She also questioned if it was possible that the CSA was contaminated before entering the Barnes-Jewish Hospital. Syncor's PRSO felt that was not the case because the CSA had known for sure that she surveyed herself the last time she exited Syncor's restricted area and the package that was delivered to another hospital prior to Barnes-Jewish Hospital was not contaminated.

There was some confusion regarding the extent of the contamination. Mr. Trunk had told Ms. Schwartz that the activity was 2.0uCi, but Syncor's PRSO confirmed it had been calculated as 0.6uCi. Ms. Schwartz also mentioned that there was a possibility that someone had dropped a syringe near the packages prior to pick up and this could be the cause of the contamination.

Later that day, Mr. Trunk called Syncor's PRSO at home for an update.

Syncor's PRSO discussed the incident with the CSA. The PRSO covered the responsibility of the customer and shipper to ensure that the packages are properly prepared for shipping. The PRSO ensured the CSA that if she had any questions, she should ask.

A dose assessment for the CSA has been performed by Syncor. The shallow dose equivalent to her extremity from the contamination of her hand is estimated to be 113 mrem. The deep dose equivalent from the contamination on her leg is estimated to be 12 mrem. The shallow dose equivalent from the contamination on her leg is estimated to be 323 mrem. Dose estimates were performed based upon the technical papers, Absorbed Doses to Skin from Radionuclide Sources on the Body Surface, by Faw and, Beta-Gamma Point Source on the Skin Problem - Activity Estimation and Dose Analysis, by Chabot and Skrable. The CSA's extremity and whole body dosimeters were sent to Lanaduer for processing. The results for both the extremity and whole body dosimeters were "M".

Based on discussions between Syncor, the hospital, and the NRC, it appears that the

cause of the event was a dropped syringe which contained some Tc-99m. This dropped syringe resulted in contamination of the outside of the package returning to Syncor.

A revised estimate activity has been calculated taking into account the instrument dead time. The initial estimate of the activity on the wipe test was 0.6 uCi. Taking into account the instrument dead time, the activity is estimated to be 1.11 uCi.

In response to this incident, Syncor's St. Louis pharmacy has placed a survey meter in the vestibule of the pharmacy to be used by Syncor drivers when they return from picking up packages from customers. Emergency procedures to respond to contamination found on a person or in an area were also reviewed with the entire staff.

Sincerely,

David W. Pellicciarini, CHP
Program Manager, Health Physics

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cc: Stacy Katsiyiannis, R. Ph., PRSO
Joseph Huber, R. Ph., Loc Mgr.
Kathy Seifert, R.Ph., BCNP, Director, Regulatory and CRSO
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