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U.S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, DC 20555

Subject: Notification of Radioactive Materials in Excess of License Limit  
Pursuant to 10 CFR § 20.2203(a)(3)(i)

### Summary of Reportable Event

On March 27, 2003, Midwest Research Institute (MRI) received a shipment of tritium-labeled custom-synthesized chemicals (tritium compounds) from ChemSyn, LLC (ChemSyn). The inventory attached to shipping documents (shipping inventory) indicated that the total activity of the tritium compounds was 6.362 Curies (Ci). However, on May 28, 2003, MRI discovered that the shipment actually contained 10.463 Ci of tritium compounds, which exceeds MRI's license limit of 9 Ci.

MRI immediately arranged for and shipped two vials containing 3.3 Ci of tritium back to ChemSyn, LLC, bringing MRI's current inventory of tritium compounds to 7.171 Ci. There was no exposure of any individuals to radiation and/or radioactive material as a result of this reportable event. MRI is reporting this event within thirty (30) days of its discovery, in accordance with 10 CFR § 20.2203(a).

### Discussion

ChemSyn's shipment to MRI was a part of the National Cancer Institute (NCI) Repository Program and consisted of 82 vials. In preparation for the shipment, a copy of MRI's radioactive materials license was sent to the Radiation Safety Officer (RSO) at ChemSyn, Mr. Clint Gregg. ChemSyn in turn provided MRI a master list of compounds in the NCI Repository Program (master list). MRI instructed the RSO at ChemSyn to transfer up to 8.5 Ci of tritium compounds from the NCI Repository Program. MRI indicated that it wanted to maintain around 0.5 Ci of space on the radioactive materials license for other research. Prior to this shipment the inventory of tritium compounds at MRI was 0.008 Ci.

When the shipment from ChemSyn arrived, I personally inspected and wipe-tested the packages. I also calculated the tritium activity level of the shipment by adding the individual activity levels listed on the shipping inventory. The total was 6.362 Ci, which is well within MRI's license limit. I then instructed MRI's Principal Safety Technician to perform a physical inventory of the shipment cross-checked against the master list of compounds in the NCI Repository Program (received from ChemSyn prior to the shipment). This master list also contained C-14 compounds that were sent in a separate

shipment on March 19, 2003. MRI's Principal Safety Technician completed the physical inventory in about 4 days. At this time, the discrepancies between the physical inventory and the shipping inventory were not discovered.

Due to the importance of the NCI repository and the number of vials in the two shipments, I directed a second physical inventory be performed by a Safety and Health staff technician. The second physical inventory was completed on April 22, 2003, and also involved cross-checking the physical inventory of the shipment against the master list. Again, the shipping inventory was not used; therefore, the discrepancies were not discovered.

The discrepancies between the master list and the shipping inventory were discovered on May 28, 2003, when the inventory from the master list was entered into MRI's computer database for radioactive materials. When the inventory from the master list was entered into the computer database for radioactive materials, which totaled the activities of the tritium compounds, it became apparent that the shipment from ChemSyn contained 10.463 Ci of tritium compounds and not 6.362 Ci as indicated on the shipping inventory.

I immediately called the RSO at ChemSyn, Mr. Clint Gregg, to inform him of the discrepancy. Mr. Greg indicated that, according to his records, the shipment contained 6.3 Ci of tritium. I pointed out that the shipping inventory did not accurately reflect the actual content of the shipment — a number of tritium compounds in the shipment were not listed. After reviewing the matter internally, Mr. Gregg confirmed that the shipment sent to MRI contained vials of tritium compounds that were not listed on the shipping inventory. We immediately arranged for the return of two vials containing 3.3 Ci of tritium. The vials were shipped to ChemSyn on June 2, 2003. MRI's current inventory of tritium-labeled compounds is now 7.171 Ci, well below its license limit of 9 Ci.

### **Corrective Actions**

MRI recognizes that the discrepancies between the master list provided by ChemSyn prior to the shipment and the shipping inventory would have been readily identified had the physical inventory been performed against the shipping inventory instead of the master list. Additionally, the activity of the tritium compounds on the master list could have been manually totaled at the time of the physical inventory. MRI is also cognizant that its delay in entering the physical inventory of the shipment into the computer database for radioactive materials contributed to the delay in discovering the discrepancy. The computer records could have been updated as soon as the physical inventory was completed.

Therefore, based on the foregoing, MRI has undertaken the following corrective actions:

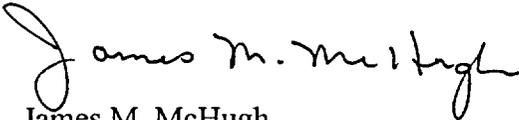
- Two vials containing 3.3 Ci were returned to ChemSyn LLC on June 2, 2003.
- MRI Standard Operating Procedure RSP-07, "Procurement, Receipt, and Shipment of Radioactive Materials" is being modified (effective date June 13, 2003) to require the entry of the physical inventory of each shipment into the database on the day of receipt or shipment.

## Conclusion

There was no exposure of any individuals to radiation and/or radioactive material as a result of this reportable event. From the time of MRI's receipt of the shipment from ChemSyn to date, the tritium compounds at MRI have been stored in a freezer within a restricted radiological laboratory. These materials have only been handled twice, during the physical inventories described above. No other tritium compounds have been received nor shipped by MRI during this period of time. MRI is reporting this event within thirty (30) days of its discovery, in accordance with 10 CFR § 20.2203(a).

MRI recognizes the importance of complying with its license limits and is committed to taking the steps necessary to prevent its recurrence. If you have any questions, please contact me at 816-753-7600, Ext. 1574. I can also be reached by email at [jmchugh@mriresearch.org](mailto:jmchugh@mriresearch.org).

Sincerely;



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Radiation Safety Officer

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