

Physics Department Minor Incidents Log

Incident No.	2003 - 10	Date:	December 9, 2003
Reportable	YES (ORPS No. CH-BH-BNL-BNL-2003-0021)	Date of Incident:	October 29, 2003
Status	ES&H Committee Final Report		
Groups Involved:	Guests (Retirees) hosted by the Department Chair		
Lead Investigator:	Ronald L. Gill		

Description:

On the afternoon of October 29, 2003 at approximately 15:00, as part of the OSHA evaluation of BNL, one of the "Rad-Focus" Teams, along with their Point Of Contact visited building 510 and asked the Department Source Custodian to show them all of the non-exempt radioactive sources in our inventory. Inspection of the Medium Energy Group's source control box in room 1-206 showed that a 3 mCi ²⁴¹Am-Be source (number 200701) was missing from the box and was not logged out on the provided check out sheet. The Physics Department Source Custodian suspected that the source was in use by guests (retirees) who were preparing a neutron counter array to be used in an experiment at the LEAF facility in the Chemistry Department, building 555. Inspection of their work area (Building 510, room 1-204, next door to the source box) located the source. The source was inside the counter array with the attached radiation tag clearly visible. The door to the room was opened, the lights were on, but no one was present. The source was immediately removed and placed into the Department's storage area (1-136) to secure it.

On October 31, 2003, the Department Source Custodian sent an email to the Physics Department ES&H Committee describing the event and suggesting that the Committee should investigate this incident. The Department ES&H Coordinator recommended that the ORPS Categorizer be called since this could be a reportable occurrence. A call to the Categorizer resulted in its classification as a reportable off-normal occurrence.

Subsequent discussion with one of the researchers indicated that he believed source 200701 was checked out by the Department RCD Representative. Examination of the source check out logs for room 1-206 and room 1-136 (the RCD Representative's area) showed that the source was removed from 1-206 on 9/22/02 by the RCD Rep. to 1-136, then transferred from 1-136 to Building 555 on 9/27/02. According to the 1-206 log, the source was returned to 1-206 on 10/7/02 by the researcher. The source was again checked out on 11/14/02 by the researcher and taken to building 555, apparently by way of 1-136. The 1-206 log shows it was returned to 1-206 on 5/9/03 by the RCD Representative. There are no further entries in the 1-206 log related to source 200701.

During the investigation meeting on November 7th, the researchers stated that they informed the RCD Representative and the Source Custodian that they would be using the source in room 1-204. They were under the impression that this was all that was necessary to use the source and that no entry in the check out log was required. This impression may have been reinforced by the RCD Representative's assertion that, if they had the source out of the box, and were physically with the source at all times, there would be no need to sign it out. However, during the investigation it was stated that the source was typically used and left unattended for long periods extending over several months. The nature of their work required the use of the source for counting periods sometimes in excess of a week. Since the source represents no significant hazard (as determined by a radiological survey – neutrons: 0.0 microRem/hr, gamma: 0.7mRem/hr on contact, 0.03 mRem/hr at 30 cm.), leaving it in the detector unattended is an acceptable use of the source, provided it has been logged out in accordance with Department policy.

The Department developed a clear and specific set of rules for working with radioactive sources and made it official policy that was published in its web pages, on May 6, 2002. All personnel that are using sources and/or advising others on proper source use must be familiar with these rules and must send an accurate and consistent message to source users.

The researchers are not working as a direct part of a Physics Department "Group" and thus have a lower level of scrutiny and accountability than is normally the case. Although their work is described in an approved Experiment Safety Review, there is no line manager who has the responsibility for their work.

The source activity exceeds the 10 CFR 835 Appendix E, Sealed Radioactive Source Accountability Table, making this a reportable occurrence.

Immediate Actions: Department

- 1) The source was immediately removed from the experiment and placed in the Department's storage area (1-136) to secure it. On October 30, the Department Source Custodian performed a physical inventory of all radioactive sources in Building 510. All sources were accounted for. Two exempt quantity sources were missing from a source box, but were immediately accounted for by the custodian, and the check out log updated. Another source was located that did not have a Bar Code, but was determined to be in the process of being added to the inventory, and the bar code arrived the next day.
- 2) After discussion of the event on 11/3/03, the source locker containing the remainder of the Medium Energy Group's sources was also placed in 1-136. This was due to Department concerns about the possible large number of personnel who may have access to this locker. Since all of the source boxes can be opened by Department master keys, and there are many such master keys in circulation, it was decided that all source box locks would be changed to a different lock series with a small number of master keys being issued.

Root Cause:

Personnel error: Failure to follow established procedures for control of a non-exempt radioactive source by not signing out the source in the logbook.

Contributing Causes:

The practice of allowing a source to be used for short periods, under direct control of a user, without being checked out led to confusion and misinterpretation of control requirements.

Corrective Actions: Department

- 1) Change all source box locks to a different lock series.
- 2) All source custodians will be re-trained with the Department Policy for Radioactive Source Control with a "read and acknowledge" form when the locks are replaced in order to receive their new keys. They will ensure that any users of sources sign out the source in compliance with Department Policy.
- 3) A copy of the Department Policy will be either in the source logbook or at the box.

Lessons Learned:

Workers must be aware of safety and control related policies and remain personally responsible for knowing that they exist, understanding, and following them. In this case, the Department had a published set of procedures that the researchers were unaware of.

Deviations from established procedures shall not be allowed, unless the Radioactive Controls Division or proper authority gives dispensation. In this case, trying to facilitate short-term source use led to a more complicated set of "spoken" rules and eventually to the misunderstanding that led to this incident.

The above incident has been investigated and requires no further action.

S. Aronson, Department Chair

Date

S. M. Shapiro, ES&H Committee Chair

Date