

THE PENNSYLVANIA STATE UNIVERSITY

207 OLD MAIN BUILDING
UNIVERSITY PARK, PENNSYLVANIA 16802

8 October 1979

Vice President for
Research and Graduate Studies

Area Code 814
865-6332

Nuclear Regulatory Commission
Region I
631 Park Avenue
King of Prussia, PA 19406

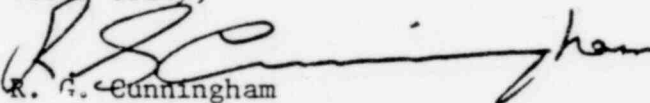
Att: Robert McClintock

Gentlemen:

On 5 Oct 79 the Health Physics Office of The Pennsylvania State University was notified of the loss of up to 25 μ Ci of Ca-45 to the non-radioactive trash. This was reported by phone to Mr. McClintock by the University Health Physicist on the same date. Enclosed is the incident report prepared by the Health Physics Office which describes the incident in detail. There was no detectable contamination or radiation exposure as a result of this incident and the material was buried in a sanitary landfill where it will present no further hazard. It is our understanding that a written notice is not required by 10CFR20.402, but we feel that the incident is of sufficient interest to submit a report for your information.

You may contact this office or the Health Physics office for any further information on this matter.

Yours truly,



R. G. Cunningham

Vice President: For Research and Graduate Studies

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THE PENNSYLVANIA STATE UNIVERSITY
HEALTH PHYSICS OFFICE

INCIDENT REPORT

Type: Loss of radioactive material.

Date: 5 Oct 79

Description: On 5 Oct 79 the University Health Physicist (UHP) was notified by investigator "A" that the radioactive waste container in room 206 Althouse had been emptied the previous night, presumably by the janitorial staff. The investigator had left the 30 gallon fiber drum standing without a lid in front of the hood at about 21:30 on 4 Oct. The drum was empty and the liner had been replaced with one of a different color when he returned to the lab on 5 Oct at about 10:30. The container was a yellow fiber drum of 30 gallon capacity and was about 1/3 full of solid waste. The sides of the container were labeled with three 5"x5" radioactive material labels spaced around the drum circumference. It was lined with a 0.003" polyethylene drum liner. The contents consisted of absorbent paper, about 150 glass Pasteur pipets, 150 6x50 mm centrifuge tubes, and small quantities of other assorted wastes. The total activity in the container was estimated to be between 15 and 25 μCi of Ca-45. The centrifuge tubes had been used for blood samples which were centrifuged to separate the plasma from the red cells. The plasma, which contained most of the Ca-45 activity, was removed with a pipet and analyzed for Ca-45. The empty pipet, containing some plasma adhering to the inner walls, was discarded in the radioactive waste along with the centrifuge tube containing the red blood cells. The investigator left the lid off of the waste container to insure that the red blood cell residue would dry and not decompose creating an odor problem. Most of the activity would be expected to be on the interior walls of the pipets and would not pose a contamination problem unless the pipets were broken and distributed around an area.

The dumpster box into which the waste had been placed was emptied and the refuse taken to the waste transfer station before 11:00 on 5 Oct. At the transfer station the waste is combined in semitrailer loads and transported to a licensed sanitary landfill for burial. Considering the small amount of activity, the relatively short half-life and the way it was contained it did not present any hazard to the public and no attempt was made to recover it.

The Nuclear Regulatory Commission was notified by a phone call to Robert McClintock at the King of Prussia, PA office at about 11:37. He agreed that a recovery attempt

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was not warranted and was advised that a written report would be submitted by the University.

Janitor "B", who had presumably emptied the radioactive waste container, did not report for work on the evening of 5 Oct and was contacted by phone by the University Health Physicist. He remembered removing the plastic liner from the radioactive waste container after the room and waste container was described to him. He stated that he had removed the liner containing the radioactive waste, placed it in a transfer container with other trash, and then put it in the dumpster collection box outside the building. He did not touch or empty any of the waste from the drum liner. He also indicated that he had never been told about not emptying radioactive waste containers, even though he has worked in buildings with radioisotope laboratories for a number of years. However, he had not been responsible for emptying waste containers in this lab until several weeks ago when the janitorial services were revised. Janitor "B" was instructed by the University Health Physicist not to empty any containers with the radiation symbol on it. (He was also instructed not to empty any other containers labelled as containing a biohazard or hazardous chemicals).

The radioactive waste container, the floor around it, and other regular trash containers in room 206 along with several other containers used by the janitors to transfer trash were surveyed with a thin end-window GSM (Eberline E-120/HP-260) and with smears. There was no detectable contamination with the GSM and all smears were less than 100 dpm/100 cm².

Consequences: There was no detectable contamination of personnel or property on campus. The radioactive material was contained within a moderately heavy polyethylene liner which should have prevented any contamination of the dumpster collection box or any of the trucks. Because of the short half-life, 163 days, the material will not present any future hazard at the landfill site. Assuming that an individual in the general public would ingest or inhale 1% of the 25 μ Ci maximum activity in the waste container the deposition in bone would be about 0.13 μ Ci giving a bone dose of about 0.05 rem (ICRP-10) or 3% of the permissible annual dose. Thus the possible radiological consequences are minor. Based on a comparison of the permissible workroom concentration in air for Ca-45 (0.03 μ Ci/m³) with that for inorganic mercury (0.05 mg/m³) the complete release of 25 μ Ci of Ca-45 is comparable to the release of 42 mg of mercury which is less than the amount contained in two 40 watt fluorescent lamps.

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Cause: The primary cause of this incident was leaving a radioactive waste container unattended with the lid removed. This is contrary to University procedures. The secondary cause was inattentiveness, and possibly improper instruction of the janitor who emptied the container. Both investigator "A" and janitor "B" have had years of experience and should have been aware of the correct procedures.

Corrective action: The investigator has been notified of the importance of keeping radioactive waste containers covered. This item is covered in the routine radiation safety lecture required for all radioisotope users and is an item that is checked during laboratory surveys by the health physics staff. Janitorial personnel are supposed to be instructed not to empty any containers labeled with the radiation symbol and the janitorial locker rooms are to be posted with this information. This practice was instituted about five years ago after an incident very similar to this one (waste was recovered in that case) and has been successful until this incident. A check of the locker room for the Althouse Laboratory janitorial staff subsequent to this incident indicated that the posting had been removed some time ago. A new poster is in preparation. As part of the renewal of the byproduct material license a radiation safety section will be added to the training and retraining program for maintenance and operations personnel. This material will be prepared by the Health Physics staff and presented by the physical plant training staff. This program should be in operation by 1 Jan 80.

Rodger W. Granlund
University Health Physicist
6 Oct 79

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