Mallinckrodt NUCLEAR
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April 23, 1968

Director, Division of Compliance
U. S. Atomic Energy Commission
1717 "H" Street
Washington, D.C. 20545

Dear Sir:

Routine thyroid burden measurements on a technical employee showed only .06 microcuries of ^{131}I on 3/25/68. However, on 3/28/68, after he made routine repairs and adjustments to a sodium iodide capsule machine, the measured ^{131}I in the vicinity of his thyroid gland was approximately 0.30 microcuries. He was restricted from further work with iodine compounds until his average weekly thyroid burden had decreased below 0.07 microcuries of ^{131}I.

The average of the high value and others taken during the week resulted in a value of 0.18 microcuries for the week ending 3/31/68. During the twelve week period in 1968 prior to this incident, the weekly thyroid measurement of ^{131}I for this employee shows a high value of 0.021 microcuries and a low value of less than 0.002 microcuries. For the thirteen week period including the week of the incident, the average is 0.014 microcuries equivalent to 10 percent of the permissible thyroid burden for that Calendar quarter. This would result in a 0.8 rem exposure to the gland, which compares favorably with the 8 rems per quarter recommended by the ICRP.

The integrated dose to the thyroid gland which would result from the decay of 0.30 microcuries of ^{131}I on an acute uptake basis is approximately 2 rems which also compares favorably with the ICRP recommended 8 rem per quarter exposure.

Our investigations show there had been a small leak in the plastic tubing which carries sodium iodide solution in the lower cabinet section of a capsule machine enclosure. This employee is one of the experienced specialists who is authorized to make adjustments or repairs to this part of the unit which he did do on March 28. This is an operation he has done many times before and has not previously had significant interal deposition. We have assumed that respiratory protection was not adequate or that exhaust ventilation for the enclosure was sub-normal. Tests made after the fact are inconclusive. Other persons who were in the general

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vicinity of this operation on 3/26, 3/27, or 3/28 were checked for contamination without significant findings. General air samples and wipe samples for this period show some elevation, but not out of line with normal variation. It seems certain that this was an incident where airborne concentration in the lower part of this enclosure was unusually high, probably due to the tubing leak.

The following corrective action was taken:

1. New filters were installed on the enclosure exhaust and the ventilation system was tested to assure adequate air flow.

2. A Manometer was connected to the exhaust manifold for the enclosure and installed at the operators position. Instructions have been issued that work must stop and investigations must be made when the differential pressure is less than the control point.

3. Pressurized plastic hoods, which cover the head and shoulders, along with connected compressed air supply, have been provided at this location. Any person who enters this enclosure to make adjustments must be fitted with one of these hoods.

We regret the circumstances which caused this modestly elevated thyroid burden and are confident that the remedial action already taken does safeguard against a recurrance.

Sincerely yours,

Donald W. Soldan

Donald W. Soldan, Manager
Health Physics Department

DWS:clt

CC: Director of Region III

The individual referred to in this report is [redacted] who is a calibration specialist for Mallinckrodt/Nuclear at Maryland Heights, Missouri.

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