

December 29, 1976

Mr. James M. Allan, Chief
Fuel Facility and Materials Safety Branch
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Reference U.S. NRC License
No. 24-04206-01

Dear Mr. Allan:

The thyroid burden of a production technician was 0.03 microcuries of Iodine-131 before beginning work on November 24, 1976. Upon conclusion of work, the individual reported for a final thyroid burden measurement as required by specific procedure at which time a burden of 0.32 microcuries of Iodine-131 was measured.

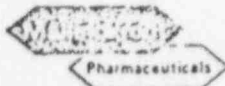
Air concentrations of Iodine-131 considerably above normal were measured in the area in which the individual was working. Other individuals working in the area for considerably shorter times had increased burdens although well below 0.14 microcuries.

Within the room were two shielded solid waste containers one of which is ventilated and under negative pressure for waste in volatile chemical forms. Found inside the unventilated waste container were "empty" bottles without screwcap closures which previously had held concentrated solutions of Iodine-131 in a volatile form. We have concluded that these bottles were the source of the elevated air concentrations and subsequent thyroid burden of the individual. We could not determine the individual or individuals who handled the waste in this manner.

The individual's average thyroid burden for seven consecutive days was 0.34 microcuries extrapolated to day one using a best fit curve having a 7.59 day effective halflife. The numerical average burden for the calendar quarter was 0.07 microcuries equivalent to an exposure to the thyroid of 4 rems. This compares favorably to the 7.5 rem limit recommended by the ICRP.

Corrective actions taken to prevent a recurrence include the following:

- 1) Additional ventilated enclosures have been provided for shielded waste containers.



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- 2) New procedures have been written for handling of radioactive waste. These procedures are part of a new Radiation Safety Program to be submitted to the Radiation Safety Committee for approval.
- 3) All individuals involved were cautioned about proper waste handling procedures.
- 4) The negative pressure within the particular room was increased for additional air flow.

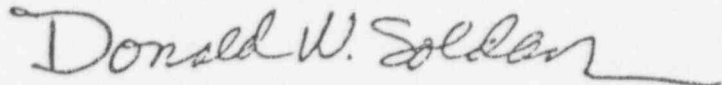
Equating the individual's thyroid burden to maximum permissible air concentrations for a 40 hour work week would result in 3.3 times the MPCa for Iodine-131.

$$\frac{1 \text{ MPCa}}{9 \times 10^{-9} \text{ uci/ml}} \times \frac{0.34 \text{ uci}}{10^7 \text{ ml/day (.23)}} \times \frac{40 \text{ hrs}}{5 \text{ days}} = 131 \text{ MPCa-hrs}$$

It is our understanding that future reports of this type will not be necessary being superceded by the provisions of new paragraphs 10CFR-20.103, 20.104 and 20.405 effective December 29, 1976.

Sincerely yours,

MALLINCKRODT/NUCLEAR



Donald W. Soldan
Chief Radiological
Protection Officer

MWS/slh

cc: Exposed Individual
Director IE (6)
Director MIPC (1)

NOTE: The individual referenced in this report is [REDACTED]
Her social security number is [REDACTED] and whose date of
birth is [REDACTED]

Exemption 6