

**NUCLEAR DIVISION**

August 18, 1981

H. L. Fore, K-1007, MS-58, ORGDP

Discrepancy in 1954 Y-12 Film Badge Results

We have discussed the fact that ORAU's study of the film badge results on Y-12 employees revealed abnormally low penetrating radiation results in 1954 (Attachment 1). I have tried to resolve this apparent discrepancy by (1) searching for the original records for the 1953 - 1955 period, (2) discussing the situation with persons known to have been directly or indirectly associated with the program in those days, (3) searching my own memory (as a person indirectly associated with the program), and (4) closely scrutinizing printouts of the 1953 through 1955 quarterly summaries and some detailed data from those years. The following is a summary of the results of my efforts.

We were unable to find the handwritten data originally generated from this program. We did, however, locate what is believed to be the original keypunched computer record. These cards contained the same 1954 data discrepancy as that revealed by ORAU.

From talking to others, searching my own memory, and examining the data, it was possible to reconstruct information regarding the film badge program in those early years. It was established that we used a metal meter badge with an open window and a lead shield on employees with exposure potential. The interpretation of the dose was done by exposing films in that badge to known amounts of radiation and plotting a calibration curve of dose versus densitometer reading on the developed film. The films were processed weekly. The doses handwritten on data sheets were derived from manual comparison of the densitometer readings on developed films from employees' badges to calibration curves. These data were later entered into the computer system by furnishing the data sheets to computer operations personnel for keypunching.

On the basis that 50 millirem was the limit of detection and we would make the conservative assumption that each employee received the upper limit of the dose he could have received without detection, a dose of as much as 50 millirem per week was assigned to each employee with a film during the 1953 through 1955 period. This dose was assigned to gamma and penetrating radiation for those persons having potential for that kind of exposure. For persons working with natural or depleted uranium, which has only a skin (beta) exposure potential, this assignment was made to skin dose.

The study of the 1953 to 1955 data also indicated that many employees assigned to departments having penetrating exposure potential showed

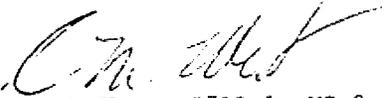
H. L. Fore
Page 2
August 18, 1981

elevated skin doses and low penetrating doses in 1954. In 1953 and 1955, they showed elevated penetrating radiation doses and low skin doses. In general, employees assigned to departments with beta exposure potential show low penetrating doses and elevated skin doses for this entire period.

Based on this finding from the data study, I believe that the 1954 penetrating and skin dose results of most employees working in departments with penetrating-dose potential were inadvertently reversed. No such reversal was made on the doses of employees working in departments with skin-exposure potential.

Consequently, for the Social Security Numbers listed on Attachment 2, we request that you exchange the penetrating and skin doses in the computer record for the Y-12 film badge program for 1954. Please forward the revised tape to ORAU.

Thank you for your help in this matter.



C. M. West, 9711-1, MS-3, Y-12 (4-3536)

CMW:ps

Attachments 2

cc: W. L. Beck, Jr., ORAU ✓
R. G. Jordan, 9704-2, MS-21, Y-12
D. L. Mason, 9723-10, MS-1, Y-12
J. D. McLendon, 9711-1, MS-3, Y-12
File - CMW - NoRC

MEMORANDUM

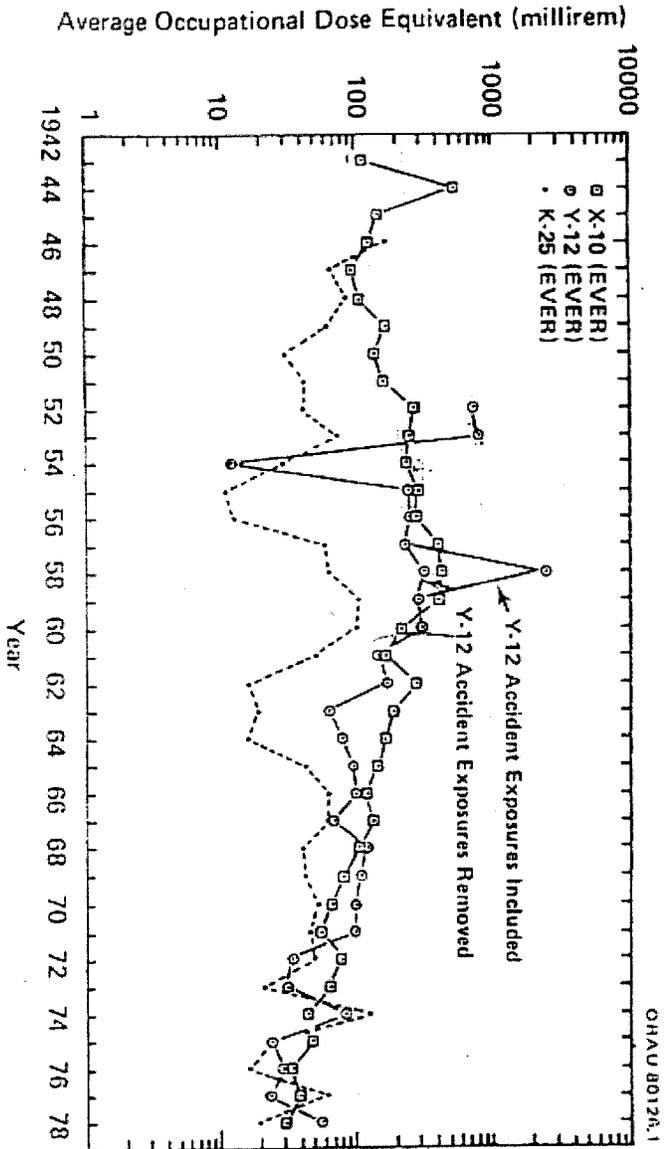
TO Donna Hudson, Y-12 Project Leader FROM W. L. Beck *WLB*
DATE December 9, 1981 COPIES TO Those listed below; ERF/File
SUBJECT CORRECTIONS TO 1954 Y-12 FILM BADGE DATA

The Y-12 Health Physics section has resolved the 1954 film badge discrepancy as described in the attached report. As you may recall, the average yearly value for a Y-12 worker in 1954 was only about 10 mrem, whereas it was several hundred mrem in 1952, 1953, 1955, 1956, etc. Lynn Sowder has recalculated by hand the yearly value based on the new information and it is 316 mrem, which seems reasonable based on the other yearly averages for that period. Howard Fore is to revise the Y-12 film badge tape and forward a corrected copy to us.

WLB:feg

Copies to: D. Cragle
C. C. Lushbaugh
D. Robie
L. Sowder
M. Wray
UNC-HAZ

Attachment 1



Attachment 2

List of Personnel for Whom 1954 Penetrating and
Skin Dose Records Were Reversed

This page contained a list of Social Security Numbers. These numbers were removed for confidentiality reasons.