

OAK RIDGE
ASSOCIATED
UNIVERSITIES

MEMORANDUM

TO: Distribution FROM: Hap West
DATE: February 19, 1991 COPIES: Files
SUBJECT: CORRECTION OF
Y12 FILM BADGE RESULTS IN THE 1950 THROUGH 1955 PERIOD

It has been determined that some fraction of the Y-12 film badge results in the subject period are flawed in that the beta and gamma results appeared to be elevated. This elevation was first noted when it was discovered that many of the doses recorded during that period showed higher levels for gamma than for beta, whereas, the exposure was mostly to normal or depleted uranium, a beta exposure potential.

In investigating this apparent inconsistency data was found in the Y-12 Records Center that gave the weekly doses for this period. It was surmised from scrutinizing these hard copy data that results were assigned either as beta or gamma based on judgement at that time as to the most likely exposure. It was further found that a large part of the recorded dose came from the practice of assigning the Minimum Detectable Level (MDL) when the film density was at or less than this level. Most of the MDL doses assigned were 50 mrad/week or month, although a few were 43 or 30 mrad for the badging period. In view of this, it is planned to substitute a more reasonable estimate of the dose for this period than the current gamma dose derived from summing up to 52 x 50 mrad, or 2600 mrad/year. In preparation for doing this we will make the following changes in the records for these years.

Before the following procedures are begun, all spurious dose data resulting from the inclusion of control badge data¹ in these records should be removed or flagged so that they are not used, nor modified. Since many of the computer film badge records do not contain beta and gamma results, but skin (beta + gamma) and penetrating (gamma), it was decided to make corrections on the bases of those attributes.

Procedures for revising quarterly results for this period are as follows. Two situations are to be corrected. Two steps are required, and the first step must be completed before proceeding to the next step. Step 1: In all records where the penetrating dose is greater than the skin dose, skin dose and penetrating dose are switched. Symbolically this is stated:

When Pen > Skin
Set Skin = Pen
Set Pen = Skin

It is noted that this situation only occurs in 1954.

Step 2. The second situation requiring dose adjustment is resolved as outlined below. Subtract the penetrating dose from the skin dose. In all cases where the difference is zero or the difference is less than the penetrating dose, leave the skin dose as it is, but set the penetrating dose equal to skin dose minus penetrating dose as in:

When $(\text{Skin} - \text{Pen}) = 0$ or $< \text{Pen}$
Set Skin = Skin
Set Pen = $(\text{Skin} - \text{Pen})$

All cases for which adjustment are made should be noted on all files that may be used in connection with these data in the future, and the meaning of the flag documented, so there will be no confusion should such a situation arise again. In addition, the original i.e., the dates before the adjustments should be preserved.

It is noted that Jeannie Pignatelli will need to redo the graphs produced for ORFCOM II to reflect the changes from this revised data.

CMW:jj

Distribution: Dr. D. Crawford-Brown
Dr. E. Frome
N. Ingle
D. Payne
J. Pignatelli
B. Tankersley
J. Watkins
Dr. J. Watson

Reference:

¹Y-12 Film Badge Control Data. West, C. M. to Tankersley, W. G. Memo. . . .
February 13, 1991.

Appendix I

Departments with High Exposure Potential as Indicated by
Monitoring Results in 1961-1965 Period

Group A

2793 9215 Rolling
2791 Special Chemical Services
2776 TW Shop Machining
2774 M-Wing Shop
2722 Beta-4 Assembly and Forming
2718 Spruce Machining
2720 Beta-4 Forming
2702 H-1 Foundry
2701 D Mechanical Operations
2691 Thorium Machining
2668
2644 Physical Testing
2640 Alpha-5, North Shop
2628 Casting
2629 9766 Machine Shop
2619 Chemical Department
2618 Uranium Chip Recovery
2617 Product Processing
2259 Physical Testing
2233 Product Inspection
2162 Product Quality Assurance
2108 Health Physics
2055 Special Mechanical Department
2037 SS Warehousing and Shipping

Group B

Departments with Medium Exposure Potential as Indicated
Monitoring Results in the 1961-65 Period

2705	Dispatching
2703	A Wing, H-2 and F areas
2699	*
2685	Machining TW
2682	*
2638	Alpha West, Machining
2637	Alpha 5, East Machining
2635	Radiation Safety
2625	Special Services
2344	Metalurgical Development
2260	Laboratory Operation
2257	Production Assay
2230	Product Analyses
2231	Special Testing
2204	*
2188	*
2187	*
2186	*
2185	*
2184	*
2183	*
2164	Plant Tooling Coordinator
2158	Area - 5, Maintenance
2144	*
2128	*
2071	*
2044	Mechanical Inspection

2038 Material Transfer and Packing

2018 Research Services

2009 *

2003 Maintenance Shops

*Either do not have department name or named department is not believed to have the same potential as these results show. Consequently, it is thought that this number must have been used for some different department for which we have no department name for this period.

Group C

All Departments Monitored in 1961-1965 Period
Which Are Not Listed in Group A or B Above

1961-1965 results are presented below for individuals in
designated department groups.

Table 1

<u>Departments and Employee Group</u>	<u>No. of Quarterly Badges</u>	<u>Avg. of Quarter Badges</u>	<u>Project Yearly Dose</u>
A Group High exposure potential	22,501	62.4	250
B Group Median exposure potential	24,915	32.8	130
C Group Low Exposure Potential	57,592	16.1	70

A Group - Departments with means >45 mrad/quarter
B Group - Departments with means <45 >25 mrad/quarter
C Group - Departments with means <25 mrad/quarter