

Office of Compensation Analysis and Support Program Evaluation Report	Document Number: OCAS-PER-004 Effective Date: 02/15/2005 Revision No. 0
Application of photofluorography at the Pinellas Plant	Page 1 of 3
Approval: <u>Signature on File</u> Date: <u>03/15/2005</u> J.W. Neton, Associate Director for Science	Supersedes: None

RECORD OF ISSUE/REVISIONS

ISSUE AUTHORIZATION DATE	EFFECTIVE DATE	REV. NO.	DESCRIPTION
02/15/2005	02/15/2005	0	New document to evaluate the programmatic effect of the discovery of photofluorographic examinations on dose reconstructions for employees of the Pinellas Plant.

1.0 Description

During the week of January 23, 2005, a reproduction of a photofluorography (PFG) film was discovered in a claimant's medical records from the Pinellas Plant. This was the first evidence of PFG use at Pinellas, and all assigned chest X-ray doses for Pinellas dose reconstructions completed prior to this discovery were based on standard 14inch by 17 inch films. Photofluorography was sometimes used at other Department of Energy Sites but had fallen out of favor by 1960 at the latest¹, largely due to the high organ doses relative to the doses for 14" x 17" films. In the absence of information to the contrary, 1959 can be considered the latest year in which photofluorography can reasonably be assumed to have been used. The organ doses resulting from PFG are higher than those for conventional PA chest radiography for selected organs, therefore this program evaluation report (PER) examines medical dose for previously completed Pinellas claims to determine whether the doses were underestimated.

2.0 Evaluation

On January 26, 2005, the NIOSH OCAS Claims Tracking System (NOCTS) was queried to determine which claims could be affected by this discovery. The considered claims were limited to those for which: (1) OCAS review had been completed; (2) probability of causation (POC) was less than 50%, and (3) the energy employee worked at the

Pinellas Plant prior to 1960. A further screen was applied to include only cancers for which the relevant organ dose is higher for PFG (Table 1).

Table 1: Organ doses for photofluorography and for 14"x17" films²

Organ	PFG organ dose (rem)	14"x17" organ dose (rem)
Thyroid	5.2E-1	3.48E-2
Eye/brain	9.60E-2	6.40E-3
Liver/gall bladder/spleen	1.35E+0	9.02E-2
Lungs (male)	1.26E+0	8.38E-2
Lungs (female)	1.35E+0	9.02E-2
Thymus	1.35E+0	9.02E-2
Esophagus	1.35E+0	9.02E-2
Stomach	1.35E+0	9.02E-2
Bone surfaces	1.35E+0	9.02E-2
Remainder	1.35E+0	9.02E-2
Breast	1.47E-1	9.80E-3
Bone marrow (male)	2.76E-1	1.84E-2
Bone marrow (female)	2.58E-1	1.72E-2
Skin	4.05E+0	2.70E-1

* Organ doses are the same for the two techniques for ovaries, urinary bladder, colon, rectum, testes, and uterus. Values were calculated from Table 4.0-1 of ORAUT-OTIB-0006, multiplied by 1.3 to account for uncertainty.

This search identified 11 potentially affected claims, the characteristics of which are listed below (Table 2). These claims were re-examined with PFG organ doses substituted for the original X-ray doses, where appropriate. The resultant PCs are listed along with the original PCs in Table 2. In no case was the PC elevated from <50% to ≥50%.

Table 2: Previously completed Pinellas dose reconstructions for which medical organ doses, and therefore probability of causation (PC), could have changed

ICD9	Cancer description	Employment start date	Employment end date	Original PC (%)	Revised PC (%)
173.6	SCC left hand	06/29/53	07/31/89	17.29	17.29
185	Prostate			30.24	30.24
	Combined			42.3	42.3
202	Lymphoma	07/15/58	11/20/68	18.72	31.89
163.9	Mesothelioma	1957	1985	16.02	17.86
185	Prostate			26.78	26.78
	Combined			38.51	39.86
174	Breast	06/26/58	11/20/59	16.21**	16.21**
202.83	Lymphoma	06/26/58	05/30/80	27.65	30.46
202.81	Lymphoma	07/01/56	07/29/66	13.84	21.23
174	Breast	05/19/58	04/16/62	25.73	26.07
174	Breast	03/12/57	12/29/61	8.56**	8.56**
174	Breast	10/01/56	04/30/62	24.88**	24.88**
203	Multiple myeloma	04/23/57	11/11/67	36.53	36.66
191.9	Brain	09/24/56	10/25/63	3.8**	3.8**

* This dose reconstruction did not assign radiation exposure during the time period when PFG may have been used (prior to 1960), therefore no change in X-ray dose was required.

** As an overestimating assumption, these dose reconstructions had already assigned X-ray doses based on photofluorography, and therefore were unchanged.

3.0 Resolution/Corrective Action

Since the likelihood of compensability is not affected for any claim (*i.e.* in no case is the PC elevated from <50% to ≥50%), no corrective action is required for any completed dose reconstruction. A site profile for the Pinellas Plant is planned, and that document will contain direction to assume PFG use prior to 1960. ORAU will be directed to revise ORAUT-PROC-0061² to reflect PFG usage at Pinellas through 1959.

4.0 Summary

Evidence of PFG was discovered in a claimant's medical records from the Pinellas Plant. As a result, PFG use at Pinellas is now assumed through 1959. This assumption will not change the likely compensability of any completed dose reconstruction. The relevant ORAU procedure will be modified, and PFG use will be assumed in the Pinellas site profile.

5.0 References

- 1) ORAU Team, *Occupational X Ray Dose Reconstruction for DOE Sites*, ORAUT-PROC-0061 Rev 00 (12/01/2004).
- 2) ORAU Team, *Technical Information Bulletin: Dose Reconstruction from Occupationally Related Diagnostic X-ray Procedures*, ORAUT-OTIB-0006, Rev 00 (11/14/2003).