

Date: 2/26/80

Name: DELETED

Social Security No.: DELETED

Company: Graver

Classification:

REASON FOR EXPOSURE EVALUATION REPORT:

- |   |  |
|---|--|
| <input type="checkbox"/> Lost Dosimeter, Film Badge or TLD No. _____    | <input type="checkbox"/> Overexposure Investigation                |
| <input type="checkbox"/> Damaged Dosimeter, Film Badge or TLD No. _____ | <input type="checkbox"/> Offscale Dosimeter                        |
| <input type="checkbox"/> Dosimeter Not Worn                             | <input checked="" type="checkbox"/> Inconsistent Dosimetry Results |
| <input type="checkbox"/> Other (Specify) _____                          |  |

EXPOSURE EVALUATION: (include nature of work, estimated exposure from RWP records, self reading Dosimetry Data, Timekeeping Data, and/or other Dosimetry Data, and Survey Report Data.)

Period of QUESTIONABLE EXPOSURE: From: 2/8/80 To: 2/25/80

See Attachment

Names of parties and certain other identifying details have been removed in order to prevent a clearly unwarranted invasion of the personal privacy of the individuals involved.

TR 2 AR

Total Estimated Exposure

Whole Body: 940 Mrem Skin: 940 Mrem Extremities: 940 Mrem

SIGNATURES:

Employee

Supervisor

Investigator

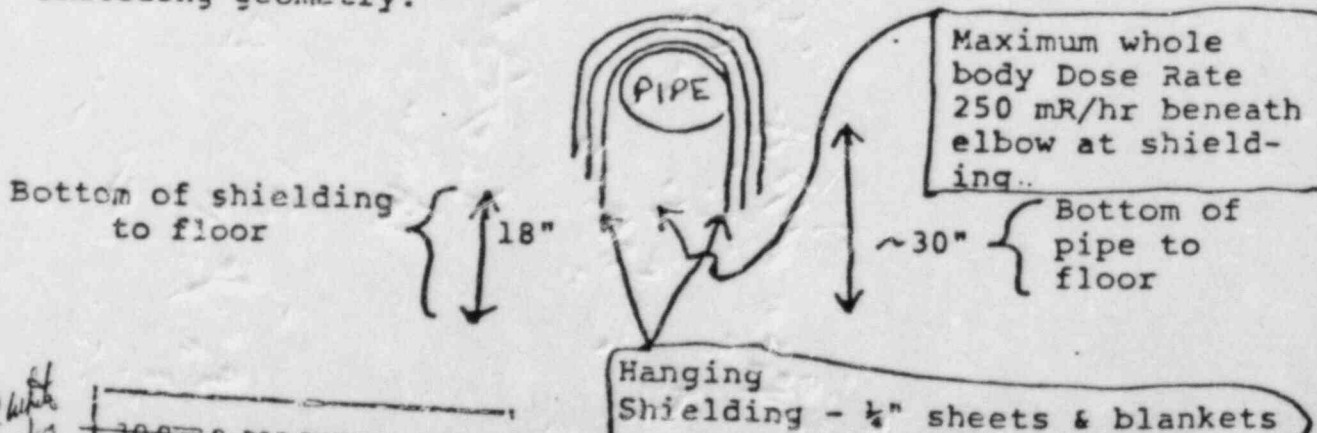
*[Handwritten Signature]* *[Handwritten Signature]* *[Handwritten Signature]*

8404180278 840314  
PDR FOIA  
TENNYS083-791 PDR

S. 6.46.1  
2/21/83

## A. Statement of Occurrence and Sequence of Events

1. At about 1500 on 2/25/80, H.P. Technician, R. A. Oliveira, made a routine Thermoluminescent Dosimeter (TLD) processing run to determine TLD data for several personnel.
2. At about 1615, results of the TLD run were received from RS Landauer. Mr. Oliveira informed W. Guest, acting H.P. Records Supervisor, who then immediately informed A. R. Trudeau. The TLD report indicated an exposure of 5.39 Rem had been received by DELETED. With the previous TLD reading of 2/8/80, DELETED net reported exposure for the first quarter of 1979 was possibly 5.98 Rem.
3. At about 1630, R. Gray of Landauer was contacted for verification of the 5.39 Rem. data. This data was confirmed at about 1640.
4. B. Sklar from the BECO. Torus staff was called to ascertain what DELETED job was and his work location for 2-25-80. He indicated that DELETED was a foreman and that he had worked between columns #16 and #1 installing a Torus support saddle near column #1.
5. An investigation into the reason for processing DELETED TLD identified dual purposes:
  - a. His pocket dosimeter (POD) and TLD total by R.E.P. card showed a dose of 1.485 Rem for the current quarter, and
  - b. His POD total for one entry on 2-25-80 indicated an abnormally high total of 250 mrem.
6. M. G. Bensch was notified of the potential problem at about 1650.
7. A detailed radiation survey was performed at about 1715, between columns #16 and #1. General area dose rates varied from 25 to 80 mR/hr with a maximum dose rate of 100 to 150 mR/hr directly beneath a shielded six inch pipe. Maximum contact dose rates on top of the shielded pipe were about 80 to 100 mR/hr and beneath the shielded pipe were about 2 to 3 R/hr. Whole body exposure from the levels at contact beneath the shielded pipe were not possible due to the shielding geometry:



Names of parties and certain other identifying details have been removed in order to prevent a clearly unwarranted invasion of the personal privacy of the individuals involved.

9. R. White  
2/28/83

J. K. A. 6. 6.  
3/21/83

## B. Exposure Evaluation Information

1. A complete review of DELETED work assignments has been performed and verified by discussions with DELETED. The most recent TLD processing had been on 2/8/80, therefore, the detailed evaluation process commenced as of that date.

2. DELETED POD data from 2/8/80 through 2/25/80 was as follows:

(2/8 @ 0340 TLD reading 590)

2/8	35	(RWP 80-343)	
2/10	45	"	
2/11	50	"	
2/12	35	"	
2/13	40	"	
2/14	55	"	+ 15 (R.E.P)
2/16	80	"	
2/17	50	"	
2/18	50	"	
2/19	25	"	+ 5 (R.E.P)
2/20	45	"	+ 5 "
2/21	70	"	
2/22	80	"	+ 5 (R.E.P)
2/25	280	"	
	940	mrem by POD	

His TLD and POD were always worn together in the pocket of the protective clothing when not worn together on his personal clothing.

3. As a foreman, DELETED was in charge of a work crew and spent his time in radiation areas with this work crew. He always worked with the crew, therefore, his radiation exposure dose should be approximately the same as that of the crew. This is the only job that DELETED has been assigned at PNPS. In performing his job, at least 90% of the time in the Torus compartment was spent in an area identified as the "work area" and the remaining time was spent in the other areas of the Torus compartment receiving and moving materials to the "work area". His work crew consisted of the following personnel:

Name	SS No.	Dates on Work Crew
Dubin	DELETED	2/18, 19, 20, 22
Drinkwater	DELETED	2/8, 13, 14, 16, 17
Horan	DELETED	2/14
Keefe	DELETED	2/12, 13, 14
Foster	DELETED	2/13, 18, 21
Lubin	DELETED	2/8
McAndrews	DELETED	2/8, 10, 11, 12, 13, 16, 17, 18, 19, 20, 21, 22, 25
Manning	DELETED	2/8, 10, 11, 12, 13, 14, 16, 17, 18, 19, 20, 21, 25
Nacaula	DELETED	2/10, 11, 12
Symonds	DELETED	2/21, 22
Wardzznski	DELETED	2/21, 22
B. Chilardi	DELETED	2/21, 22

Names of parties and certain other identifying details have been removed in order to prevent a clearly unwarranted invasion of the personal privacy of the individuals involved.

J. K. A. 6. 6.  
3/21/83

4. The POD data for each member of the work crew was also reviewed and showed the following results:

- a. On a day to day comparison the work crew exposure and DELETED exposure were reasonably similar based on actual time in the work area.
- b. The total exposure received by members of the work crew who were most often assigned to work for DELETED DELETED since 2/8/80 was also reviewed:

Name	Dates	Dose	Dosimetry
DELETED	1/2→2/25	1180	TLD & POD
DELETED	1/2→2/25	900	TLD & POD
DELETED	1/16→2/25	990	TLD & POD

c. The total exposure received by other members of the work crew through 2/27/80 was as follows:

Name	Through Date	Dose	Dosimetry
DELETED	2/27	965	POD
DELETED	2/18	595	TLD & POD
DELETED	2/25	845	POD
DELETED	2/27	925	POD
DELETED	2/26	760	TLD
DELETED	2/26	465	TLD & POD
DELETED	2/26	710	POD
DELETED	2/26	820	POD
DELETED	2/19	540	TLD

5. The TLDs of some members of the work crew were also processed periodically throughout their period of work assignment and indicated satisfactory results when compared with POD data. These individuals are:

Name	Date	TLD
DELETED	2/19	540 (terminated)
DELETED	2/20	660
DELETED	2/18	200
DELETED	2/17	800
DELETED	1/25	120
DELETED	1/31	90
DELETED	2/5	100
DELETED	2/23	930

Names of parties and certain other identifying details have been removed in order to prevent a clearly unwarranted invasion of the personal privacy of the individuals involved.

J. R. H. L.  
2/24/83

6. The survey data for the work areas of DELETED crew was reviewed and indicated average general area dose rates of 5 to 20 mR/hr with maximum general area dose rates of 50 to 70 mR/hr. The specific work assignment of the work crew was installation of new TORUS saddles and the work area encompassed about 25% of the TORUS compartment in the Southwest corner.
7. As a maximum possible evaluation of the dose to DELETED the total time signed into the work area was calculated, minus 5 minutes as dress up time for each entry, without any reduction in time for travel to and from the work area (100 feet down stairs and a ladder) or for undressing prior to being signed out on the RWP. If the maximum general area dose rate is 60 mR/hr, then all the time spent in the area would result in an exposure of 1 mR/minute. The following is a list of the amount of time spent in the Torus compartment for each day following the 2/8/80 TLD reading:

Date	Minutes
2/8	265
2/10	275
2/11	350
2/12	215
2/13	275
2/14	185
2/16	375
2/17	305
2/18	315
2/19	160
2/20	305
2/22	330
2/25	340
	240
	3935

Assuming that DELETED was in the maximum general area dose rate field for each of these minutes, his maximum potential dose would have been 3.935 Rem.

### C. Conclusion

The most probable explanation for the inconsistency is that DELETED TLD was willfully exposed by a co-worker without his knowledge. The reasoning behind the conclusion is as follows:

1. His POD total for the period was consistent with that of his crew members based on time in the work areas.
2. His POD was never off-scale and was always worn in close proximity to this TLD on his person.
3. The TLD and POD comparative data for other members of the work crew showed no abnormalities.
4. The survey data indicates that, for DELETED to have received the amount of exposure identified to TLD, for

Names of parties and certain other identifying details have been removed in order to prevent a clearly unwarranted invasion of the personal privacy of the individuals involved.

J. R. H. L.

91.46.1 4-8-13

the period 2/8 through 2/25, he would have had to spend more time in the work area than documented and all the time would have had to been spent in very high general area dose rates location.

5. Even the POD data of 280 for 2/25/80 is questionably high; however, it will be assessed as true exposure for conservatism.
6. DELETED has supervised most of his co-workers at prior job locations and as a foreman or general foreman he has had occasion to take disciplinary action against some of the co-workers.
7. DELETED will be assigned a total of 940 mrem for the period 2/8/80 through 2/25/80.

8. At about 1745, T. Fulton of Landauer was contacted for processing of the QA (3rd) chip in DELETED TLD card.
9. At about 2130, C. Anderson of Landauer arrived at PNPS to process the QA chip. Results received at about 2200 indicated that the TLD card had apparently been dosed to approximately 5 Rads.
10. DELETED TLD card and two other TLD cards were exposed to about 5 Rads, calculated dose, using a 50 Ci Cs'37 source:

"R" Chamber (25R) - Result	TLD card - Result
# 12401 5.0	028283 5.5
X2251 5.3	099384 5.36
12435 5.3	[ 102312 ] 7.0
	[ DELETED ]

11. At about 1100 on 2/26/80, the same cards exposed to calculated 5 Rad dose on 2/25 were exposed to 1.2 Rads, calculated dose, using the same 50 Ci source:

"R" Chamber - Result	TLD card - Result
# 12287 a) 0.956	028283 1.34
b) 0.980	099384 1.25
#12341 a) 0.998	[ 102312 ] 1.32
b) 1.032	[ DELETED ]

12. At about 1300 on 2/26/80, the same cards were again exposed to a calculated exposure of 5 Rads.

TLD card - Results
028283 6.42
099384 6.08
[ 102312 ] 6.39
[ DELETED ]

13. All QA chip results were consistent with the #1 & #2 chip results.
14. The exposure tests identified in 10, 11, and 12 were performed to evaluate the response characteristics of the TLDs. Although the test results in 10, for DELETED TLD indicated a higher than anticipated reading, the re-verification in 12 indicates that the 7 Rad result was likely due to poor geometry during the initial exposure test.