
Draft

**ADVISORY BOARD ON
RADIATION AND WORKER HEALTH**

National Institute for Occupational Safety and Health

Evaluation of Claims with Supplemental Dosimetry Requests

**Contract No. 211-2014-58081
SCA-2016-SEC-0074F, Revision 0**

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S. COHEN & ASSOCIATES: *Technical Support for the Advisory Board on Radiation & Worker Health Review of NIOSH Dose Reconstruction Program*

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ABBREVIATIONS AND ACRONYMS

ABRWH	Advisory Board on Radiation Worker Health
ANL-W	Argonne National Laboratory – West
AX	Construction in Test Area North
ATR	Advanced Test Reactor
CATI	Computer Assisted Telephone Interview
CFA	Central Facilities Area
CPP	Chemical Processing Plant
CX	Construction at CPP
DOE	Department of Energy
DOL	Department of Labor
EE	Energy Employee
EBR	Experimental Breeder Reactor
GET/GERT	Unknown
HP	Health Physics
INEL	Idaho National Engineering Laboratory
INL	Idaho National Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
LFC	Location File Card
LOFT	Loss of Fluid Test
MRF	Unknown
MTR	Materials Test Reactor
NIOSH	National Institute for Occupational Safety and Health
NRF	Naval Reactor Facility
NRTS	Nuclear Reactor Test Site
OMRE	Organically Moderated Reactor Experiment
OX	Construction at OMRE
RWMC	Radioactive Waste Management Complex
S5G	Submarine Platform Reactor, Generation 5, General Electric
SC&A	Sanford Cohen and Associates
SEC	Special Exposure Cohort
SL-1	Stationary Low-Power Reactor Number 1

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TAN Test Area North
TLD Thermoluminescent Dosimeter
TRA Test Reactor Area
WBC Whole Body Count
WG Work Group

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1.0 BACKGROUND

As a result of discussions undertaken at the July 8, 2015, Idaho National Laboratory (INL) Work Group (WG) meeting and the July 23, 2015, Advisory Board on Radiation and Worker Health (ABRWH) meeting in Idaho Falls, Idaho, SC&A and the National Institute for Occupational Safety and Health (NIOSH) were tasked with continuing to evaluate the proposed Special Exposure Cohort (SEC) class definition for the Chemical Processing Plant (CPP) (1963–1974). NIOSH transmitted the results of their ongoing evaluation on August 21, 2015 (NIOSH 2015), and noted that there were 11 claimants that had been identified as requiring follow-up data capture for relevant dosimetry records. In tandem with this effort, SC&A’s evaluation had identified 11 additional claimants and requested that they also be forwarded on to INL for dosimetry completeness evaluation.

Data requests were made to INL for NIOSH and SC&A’s identified claimants on October 2, 2015, and October 21, 2015, respectively. Responses were received from INL as soon as information was available on each claim, with the final data request being completed on December 30, 2015. At the November 10, 2015, INL WG meeting and again at the November 18, 2015, ABRWH meeting, NIOSH indicated that they had removed 4 of their 11 claims from requiring additional follow-up with INL. Although the reasons for removing these claims were not explicitly stated, it appears that the 4 claims were removed from the original 11 NIOSH claims for the following reasons:

- Three of the four claims had evidence of external monitoring during the latter SEC period (1970–1974), and thus had met the proposed SEC criteria.
- The fourth claim did not have 250 days of covered employment in either of the SEC periods, and thus would not meet the required employment criteria.

As such, there were ultimately 7 NIOSH claims and 11 SC&A claims for which additional data capture efforts were requested and received from INL. This memo represents SC&A’s review of the additional information provided for the 18 total claims identified by NIOSH and SC&A

As a result of this evaluation, SC&A had the following six observations:

Observation 1: Five of the 18 claims contained a listing of a “box” and “record number” for the relevant claimant dosimetry records. In one of those five claims, it appears that an “area exposure report” related to the claimant could not be located. It should be noted that NIOSH has undertaken a comparison of monthly Health Physics (HP) reports versus the available dosimetry printouts, and NIOSH concluded the records available (at least for CPP in the 1963–1970 timeframe) are complete for the purposes of SEC administration.

Observation 2: SC&A identified evidence (specifically an in-vivo record) of a claimant entering CPP in 1966 that did not have associated external dosimetry for CPP.

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Observation 3: Case #3 provides an example where internal monitoring indicates CPP during the latter SEC period (1970); however, there is no external monitoring at INL after 1960.

Observation 4: Case #4 (and also Case #7) contained dosimetry logbooks that were undated and the columns were unlabeled. SC&A was able to determine that these logbooks were not associated with CPP and were related to the Stationary Low-Power Reactor Number 1 (SL-1) incident in January of 1961. SC&A has assumed that this format is exclusively associated with the SL-1 incident.

Observation 5: SC&A noted that in Case #5, the original record transmittal only included the career dose totals, which appear to omit the external monitoring that occurred from 1965 to 1967. While it is possible this is the result of the claimant actually working at the Naval Reactor Facility (NRF), it calls into question the use of “career dose totals” for establishing monitored periods during the proposed SEC period.

Observation 6: The “annual dose summary” report for Case #6 indicates that the claimant was monitored from 1963 to 1966; however, individual dosimetry reports are not available to ascertain the exact work location during this time.

2.0 EVALUATION OF 18 CLAIMS REQUESTED BY SC&A AND NIOSH FOR FOLLOW-UP

In this section, a summary profile of each of the 18 claimants is presented and includes the following information:

- Covered SEC Employment
- Job Title(s)
- Original comments and rationale for selecting the individual claim for supplemental data requests
- Relevant information received from the Department of Energy (DOE)/INL as a result of these additional data requests
- A discussion regarding the Energy Employee (EE) in relation to the currently proposed SEC class definition

The 6 claims for which these observations were made are presented first; the remaining 12 claims are subsequently presented in random order.

2.1 CASE #1: CLAIM [REDACTED]

Covered Employment		Job Title(s)
Start	End	
[REDACTED]/1956	[REDACTED]/1992	[REDACTED]

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Original Comments and Rationale for Selection Claims (SC&A 2015):

- Location File Card (LFC) only covers up to 1962, but does indicate assignment to CPP prior to the proposed SEC period.
- Internal monitoring indicates Central Facilities Area (CFA) during the SEC period.
- Only annual external doses are available.
- Computer-Assisted Telephone Interview (CATI) with EE related to work location: “[REDACTED], MTR, CPP, Central, TAN, [REDACTED], [REDACTED], went to the site occasionally to work in the [REDACTED].” [Emphasis added]

Review Comments based on Supplemental Data Requests:

- No evidence found in complete record set to indicate assignment to CPP during the SEC period.
- Records contained an electronic listing of the “box” and “record number” for the known EE’s dosimetry records and indicated one was “Not Found” (see Figure 1).

Discussion:

While the supplemental data request did not contain any evidence to suggest the EE was potentially exposed at CPP during the proposed SEC period, the records did contain an electronic listing of the “box” and “record” related to this particular worker (henceforth referred to as the “box and record listing”). This is the first time SC&A has seen such a listing included in a claimant’s dosimetry record. As seen in Figure 1, a handwritten note suggests that either one of the boxes or the particular record (an area exposure report) could not be located.

SC&A examined each of the 18 targeted claims for a “box and record listing” and found that only 5 of 18 contained such a record. However, based on these five claims, SC&A was able to determine that only the record shown in Figure 1 was missing and not the whole box.¹ Of the limited set of five claims, this claim was the only instance where it appears that a record was unable to be located. Furthermore, evidence suggests that the missing record was likely from either November or December of 1961, based on neighboring records identified in the same box for the other four claimants’ records. Therefore the missing record is likely not germane to the proposed SEC requirements in this particular case.

However, since the assurance that dosimetry records are complete and available is of paramount importance to the accurate and fair administration of the proposed SEC class, the fact that some records may potentially be unavailable is problematic. Because this is the first time SC&A has observed a “box and record listing,” the extent to which records may not be able to be located for other workers could not be evaluated.

¹ SC&A observed that different records from the box in question were present in at least one of the other four claim files, and so it appears the handwritten note is in relation to the individual record.

It should be noted that during the November INL WG and ABRWH meetings, NIOSH presented figures comparing the number of reported dosimeters for CPP as listed in the HP summary reports versus the number of actual hardcopy records available at this time. Based on those charts and the underlying analysis, NIOSH concluded that records for CPP from 1963 to 1970 are complete for the purposes of SEC determination.

Observation 1: Five of the 18 claims contained a listing of a “box” and “record number” for the relevant claimant dosimetry records. In one of those five claims, it appears that an “area exposure report” related to the claimant could not be located. It should be noted that NIOSH has undertaken a comparison of monthly HP reports versus the available dosimetry printouts, and NIOSH concluded the records available (at least for CPP in the 1963–1970 timeframe) are complete for the purposes of SEC administration.

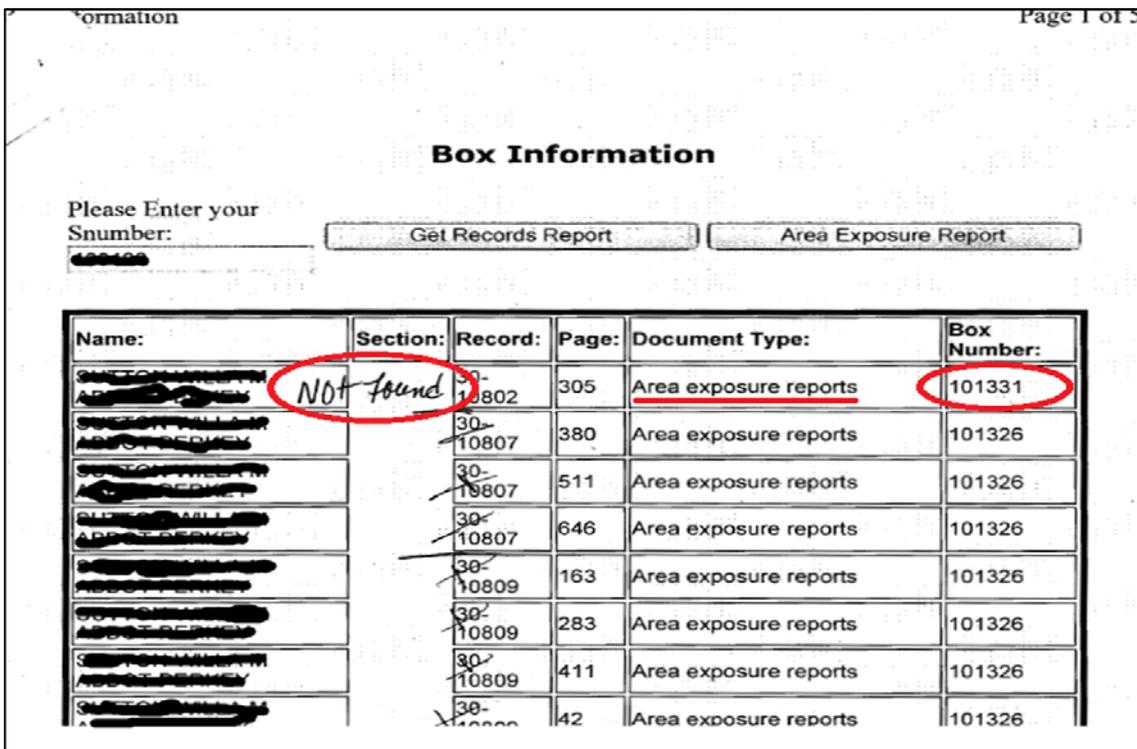


Figure 1. Screenshot of a "Box and Record Listing" Showing One of the Records Unavailable

2.2 CASE #2: CLAIM [REDACTED]

Covered Employment		Job Title(s)
Start	End	
[REDACTED]/1962	[REDACTED]/1967	Draftsman
[REDACTED]/1968	[REDACTED]/1968	
[REDACTED]/1969	[REDACTED]/1969	
[REDACTED]/1976	[REDACTED]/1976	
[REDACTED]/1976	[REDACTED]/2006	

Original Comments and Rationale for Selection Claims (SC&A 2015):

- LFC does not indicate a specific work location during the proposed SEC period; however, does indicate assignment to CPP during the 1990s.
- Internal monitoring during the SEC period is related to the CFA.
- Only the annual dose totals were available for the EE.
- CATI with the survivor indicates: “Central (689), **INTEC/CPP**, two buildings in town, all over the site.” DOL Initial Case lists CFA for SEC period but was “also required to go to other facilities.” [emphasis added]

Review Comments based on Supplemental Data Requests:

- Visitor badges were issued for the EE indicating CPP in 1984 and 1985, but not during the SEC period.
- A Whole Body Count (WBC) for the EE is labelled as CPP in 1966 (see Figure 2). The accompanying WBC questionnaire is shown in Figure 3.
- No “box and record listing” was available for this claimant.

U. S. ATOMIC ENERGY COMMISSION
IDAHO OPERATIONS OFFICE
HEALTH AND SAFETY DIVISION

WHOLE-BODY GAMMA-RAY ANALYSIS

ID-166 (Revised 12-62)

Serial No. 8260

S-NUMBER 0000

NAME: [REDACTED]
LAST FIRST MIDDLE

CONTRACTOR: INC

FACILITY: CPP

REASON FOR ANALYSIS
 Visitor Special Routine
 Termination Other _____

Date: 8/14/66 Time: 11:00 Analysis by: CPC

Approved: [REDACTED]

ISOTOPES FOUND
 COMPONENTS GREATER THAN 0.1 μ C
 Isotope Quantity, μ C
 In Data Base

COMPONENTS LESS THAN 0.1 μ C

REMARKS: Cs 137 & K 40 NORMAL

Figure 2. Screenshot of In-Vivo Record from Claim [REDACTED] Indicating the Facility was CPP

FORM 15-166 (REV. 2-64)

QUESTIONNAIRE FOR WHOLE BODY COUNTING

8280

NAME		LAST		FIRST		MIDDLE		S#	DATE
[REDACTED]		[REDACTED]		[REDACTED]		[REDACTED]		[REDACTED]	8-16-66
AGE	WEIGHT	HEIGHT	CHEST DEPTH (CENTIMETERS)	SEX	EMPLOYMENT STATUS				
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	M <input checked="" type="checkbox"/> F <input type="checkbox"/>	NRTS <input checked="" type="checkbox"/> VISITOR <input type="checkbox"/>				
CRAFT OR PROFESSION						EMPLOYER			
DRAFTSMAN						T.M.C.			
PRESENT WORK AREA						YEARS IN PRESENT WORK AREA			
CF. 689						4			
REASON FOR COUNT				ROUTINE <input checked="" type="checkbox"/>		SPECIAL <input type="checkbox"/>			
				TERMINATION <input type="checkbox"/>		OTHER _____			
LIST OTHER AREAS WHERE YOU HAVE WORKED AT NRTS:								NONE <input type="checkbox"/>	
<u>CONTRACTOR</u>		<u>AREA</u>		<u>CONSECUTIVE MONTHS IN AREA</u>					

Figure 3. Screenshot of the Whole Body Count Questionnaire Accompanying the In-Vivo Record in 1966

Discussion:

As seen in Figure 2, the EE was counted via in-vivo in 1966 at CPP. However, no dosimetry badge associated with CPP during the SEC period was identified for this claimant. The Whole Body Count Questionnaire shown in Figure 3 indicates that the present work area was CF689, which presumably refers to the CFA. Additionally, Figure 3 shows there is a section where the worker is to list other work areas at INL.² This section is blank, but also the box indicating the EE did not work in “other areas” was not checked.

The CATI report with the EE’s survivor indicated that the claimant worked “all over the site.” One possibility is that as a “draftsman,” the claimant would enter different facilities to plan modifications to equipment or new construction. If this is the case, the claimant’s main work area may have been the CFA; however, the possibility exists that the EE entered CPP to perform the duties as a draftsman. Regardless, the evidence suggests that the EE was at CPP in 1966 for the in-vivo count and no associated external dosimetry has been identified. As was noted previously, there was no “box and record listing” available for this claimant, so it is unknown if there is perhaps a missing record, the EE was not badged, or the EE never actually entered CPP.

Observation 2: SC&A identified evidence (specifically an in-vivo record) of a claimant entering CPP in 1966 that did not have associated external dosimetry for CPP.

² The form shows “NRTS,” which is an alternate name for INL, standing for “Nuclear Reactor Test Site.”

2.3 CASE #3: CLAIM ██████████

Covered Employment		Job Title(s)
Start	End	
Six Additional Employment Periods Prior to the SEC Period		Mason
██████████/1963	██████████/1964	
██████████/1964	██████████/1964	
██████████/1965	██████████/1965	
██████████/1967	██████████/1967	
██████████/1967	██████████/1970	
██████████/1970	██████████/1970	
██████████/1970	██████████/1970	
██████████/1972	██████████/1972	
Two Additional Employment Periods After SEC Period		

Original Comments and Rationale for Selection Claims (SC&A 2015):

- Available external dosimetry is restricted to 1960 at INL and does not begin again until December of 1988 at Argonne National Laboratory-West (ANL-W) (see Figure 4).
- LFC does not indicate a work area, but states the EE was employed with ██████████ during the SEC period.
- CATI report with EE does not mention CPP.
- A urinalysis monitoring result in 1970 indicates CPP (see Figure 5).

Review Comments based on Supplemental Data Requests:

- Supplemental data requests did not provide any new information.
- No “box and record listing” is available for this claimant.

Energy Employees Compensation			
Subject: PERSONNEL RADIATION DOSE REPORT			
This report provides the radiation exposure summary during employment at the Idaho National Laboratory and/or Argonne National Laboratory for:			
██████████ ██████████		██████████	
Name		Social Security Number	
External Dose Equivalent (mrem)			
Period of Time	Deep	Shallow	Extremity
1960 INL	0	0	nm
12/1988 thru 4/1989 ANL	44	44	nm
nm = not monitored			
See attached for yearly summary			
Current Dose	None Reported		
Internal Dose	None Reported		

Figure 4. Screenshot of Case #3 External Dose Summary Showing Monitoring at INL Only Occurred in 1960

30-8658
ID - 104
(REV. 8-66)

U.S. ATOMIC ENERGY COMMISSION 30-8658
IDAHO OPERATIONS OFFICE
ANALYTICAL CHEMISTRY BRANCH

REFERENCE: HEALTH & SAFETY DIVISION

ROUTINE SPECIAL SAMPLE RECORD SHEET SERIAL NO. 50468

SAMPLE FROM: CPP SAMPLES RECEIVED: 7/1/70
COLLECTED BY: H.S.W. & A ANALYSIS COMPLETED: 7/1/70 ANALYZED BY: BE
DATE SUBMITTED: _____

SAMPLE			ANAL. FOR	INST. USED	QUANT. USED	TIME CNTD.	COUNT TIME	TOTAL COUNT	GROSS COUNT c/m	BKGD. c/m	NET COUNT c/m	KVP	RESULTS c/m
NO.	DATE	HOUR											
					70		70						
	4/10/70	4:00	8		70		5	2999	600	580	0.22	27.15	0.266
	4/10/70	4:00	1		70		1	2931	586	580	0.22	27.15	0.266
	4/10/70	4:15			70		1	2931	584	580	0.22	27.15	0.266

Figure 5. Screenshot of Bioassay Record for Case #3 Highlighting the Date (July 1970) and Location (CPP)

Discussion:

Similar to Case #2, the EE has internal monitoring associated with CPP in 1970, but external dosimetry for the individual ended 10 years earlier in 1960. As was noted previously, there was no “box and record listing” available for this claimant, so it is unknown if the EE was not badged or if there is perhaps a missing record.

Observation 3: Case #3 provides an example where internal monitoring indicates CPP during the latter SEC period (1970); however, there is no external monitoring at INL after 1960.

2.4 CASE #4: CLAIM [REDACTED]

Covered Employment		Job Title(s)
Start	End	
Five Additional Employment Periods Prior to the SEC		Electrician
[REDACTED]/1965	[REDACTED]/1965	
[REDACTED]/1966	[REDACTED]/1966	
[REDACTED]/1966	[REDACTED]/1966	
[REDACTED]/1966	[REDACTED]/1966	
[REDACTED]/1970	[REDACTED]/1970	
[REDACTED]/1970	[REDACTED]/1970	
[REDACTED]/1972	[REDACTED]/1972	
[REDACTED]/1972	[REDACTED]/1973	
Twenty-Three Additional Employment Periods After the Proposed SEC		

Original Comments and Rationale for Selection Claims (SC&A 2015):

- Career dose totals end in 1961 and then began again in 1970, though it appears this latter monitoring was associated with the NRF.
- Available dosimetry prior to the proposed SEC indicates work at CPP.

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- No LFC was available.
- CATI report with EE states:
*Areas of contamination were all over the site. They were restricted at first and then later they had to work in the areas with no indication that the area was cleaned up. **CPP was the most contaminated area. There were a lot of 55-gallon waste drums stored there. They had a lot of spills and evacuations which required restriction from the area for 2–3 days at a time. He had to evacuate MTR a couple of times while they were building ATR.*** [Emphasis added.]

Review Comments based on Supplemental Data Requests:

- LFC:
 - Employment with [REDACTED] in 1970, located at NRF.
 - Employment with [REDACTED] and [REDACTED] in 1972 and 1973; however, no area was provided. There was no external monitoring during these years.
 - Assignment to CPP and Test Area North (TAN) in 1978 and 1992.
- There are multiple temporary dosimetry badges at CPP from 1977 to 1980, and again in 1982.
- File contained multiple dosimetry logs that were undated and the individual columns do not contain headers (see Figure 6). SC&A was able to match up the assumed dosimetry results column with other records to conclude that these untitled and undated records were associated with the SL-1 incident. This was also observed in Case #7. It is assumed that all such undated and unlabeled records relate to the SL-1 incident.
- No “box and record listing” is available for this claimant.

OFFICIAL USE ONLY						076
[Redacted]	71	22	040461	80	220	
[Redacted]	53	06	061347			
[Redacted]	02	04	030016			
[Redacted]	45	00	660020			20
[Redacted]	02	16	031347			50
[Redacted]	07	00	110047			350
[Redacted]	01	03	661011			170

Figure 6. Screenshot from Claim [Redacted] Showing Undated Record with No Column Headers

Discussion:

The available monitoring results for this case showed work at CPP both before and after the proposed SEC period. Though the CATI report with the worker did indicate work in CPP and described the conditions as “the most contaminated area,” it is very possible the EE was referring to work outside the proposed SEC. Though the claim file did contain dosimetry records that were undated and unlabeled, and thus could have potentially represented CPP exposures, SC&A was able to determine that they were from the SL-1 incident by comparing the individual dosimetry results from the undated record to other dosimetry logs contained in the file. There was no “box and record listing” file provided for the claimant, so it is not possible to determine if any particular records could not be located. SC&A did not find direct evidence to suggest the claimant was exposed at CPP during the proposed SEC period.

Observation 4: Case #4 (and also Case #7) contained dosimetry logbooks that were undated and the columns were unlabeled. SC&A was able to determine that these logbooks were not associated with CPP and were related to the SL-1 incident in January of 1961. SC&A has assumed that this format is exclusively associated with the SL-1 incident.

2.5 CASE #5: CLAIM [Redacted]

Covered Employment		Job Title(s)
Start	End	
Three Additional Employment Periods Prior to SEC period		Pipe Insulator
[Redacted]/1965	[Redacted]/1966	
[Redacted]/1967	[Redacted]/1967	
[Redacted]/1973	[Redacted]/1974	
[Redacted]/1974	[Redacted]/1975	

Original Comments and Rationale for Selection Claims (SC&A 2015):

- LFC entry for [REDACTED]/1965–[REDACTED]/1966 indicates work at NRF. The other entry ([REDACTED]/73–[REDACTED]/1974) does not list a work area.
- Dosimetry files indicate monitoring ended in 1962.
- CATI with EE indicates the work areas were “S5G, CPP, TAN, LOFT, and EBR-II.” The claimant describes an incident at CPP in the 1963–1966 timeframe.

Review Comments based on Supplemental Data Requests:

- SC&A observed that the “career dose total” (Figure 7) and “annual dose summary” (Figure 8) records did not match:
 - As seen in the figures, the “career dose total” ends in 1962 and neglects 1965 through 1967.
 - Specific dosimetry records for 1965–1967 were not available.
 - As noted above, the LFC lists NRF as the work area during the covered employment in 1965–1966. The work location for the remaining uncovered employment (1967) is unknown.
- Supplemental dosimetry records included a temporary badge for “AX” (construction in Test Area North) in 1963, which was outside the covered employment.
- Three temporary badges were issued for the Technical Support Facility in 1973 and 1974.
- No “box and record listing” is available for this claimant.

November 21, 2002

Energy Employees Compensation

Subject: PERSONNEL RADIATION DOSE REPORT

For [REDACTED] Social Security No. [REDACTED]

Bechtel BWXT Idaho, LLC provides dosimetry services and maintains occupational radiation records for U. S. Department of Energy and contractor personnel at the INEEL; Grand Junction, Colorado Project Office (GJPO); and West Valley, New York Project (WV).

<u>External Dose Equivalent</u> (mrem) <i>(INEEL, GJPO, WV)</i>	<u>Whole Body/Effective</u>		<u>Extremity</u>
	<u>Deep</u>	<u>Shallow</u>	
11/4/1960	45	45	---
1962 Monthly Freq.	0	0	---
<u>Current year</u>	<u>None Recorded</u>		
<u>Internal Dose</u>	<u>None Recorded</u>		

Figure 7. Screenshot of Career Dose Record for Claim [REDACTED] Indicating Monitoring Ended in 1962

N-PEN	PENET	NEUT	YEAR	UPDT	N-PEN	CONT	CFT	SECT	COST	PAYROL	SOC	SEC	ST	BK	ISSUE	TERM	ID-MUH	BIRTH	S-MI
0	45	0	1960	4	0	0	45	0	0	0	0	0	0	0	0	0	0	0	0
0	45	0	1962	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	45	0	1965	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	45	0	1966	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	45	0	1967	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			TOTAL		0	0	45	0	0	0	0	0	0	0	0	0	0	0	0

Not included in Career Dose Summary

Figure 8. Screenshot of Annual Dose Totals for Case #7 Showing External Monitoring Occurred in 1965–1967

Discussion:

In the CATI report, the claimant describes incidents occurring in the 1963 to 1966 timeframe. However, SC&A could not find any evidence of such incidents in the supplemental dosimetry files. SC&A noted that in the original record transmittal, the “career dose total” indicated that monitoring ended in 1962. Based on the supplemental dosimetry records, which included the “annual summary report,” it appears the claimant was also monitored from 1965 to 1967. This calls into question the accuracy of the “career dose summary” for establishing monitored periods. As was noted, at least part of this period appears to be associated with NRF. This may explain why the “career dose totals” did not include these years, but it is not certain without further evidence. Since the “box and record listing” was not included in the file, it is not possible to determine if all known records for the individual were available. SC&A did not identify any direct evidence that the EE was potentially exposed at CPP during the proposed SEC period.

Observation 5: SC&A noted that in Case #5, the original record transmittal only included the career dose totals, which appear to omit the external monitoring that occurred from 1965 to 1967. While it is possible this is the result of the claimant actually working at NRF, it calls into question the use of “career dose totals” for establishing monitored periods during the proposed SEC period.

2.6 CASE #6: CLAIM [REDACTED]

Covered Employment		Job Title(s)
Start	End	
[REDACTED]/1957	[REDACTED]/1986	[REDACTED]

Original Comments and Rationale for Selection Claims (SC&A 2015):

- LFC does not indicate an assigned work area during the SEC period, and only indicates that employment was with the Idaho Nuclear Corp.
- Claimant was monitored externally at CPP in the 1950s.
- There were no external monitoring data available in the proposed SEC period.

- In-vivo results in the 1963–1965 period were associated with the CFA.
- CATI report with survivor states: “All over site [REDACTED] was in TRA and CPP... When [The EE] cleaned up reactor spills, [the EE] never wore a dosimeter, so there was no way to determine whether [the EE] had reached [the EE’s] radiation limit or to measure how much radiation [the EE] was exposed to.”

Review Comments based on Supplemental Data Requests:

- An in-vivo count questionnaire from 1965 indicates the claimant was in the same area for the previous 9 years. However, there are visitor badges associated with CPP (1959) and TAN (1961).
- The EE has visitor badges associated with CPP in 1979 and 1984.
- The “annual exposure summary” report indicates monitoring occurred from 1963 to 1965 (see Figure 9); however, the actual records (indicating work location) were not included in the supplemental dosimetry records.
- No “box and record listing” is available for this claimant.

Year	002	026	04	EG21	040661	1017
1957	0	0	0	0	0	0
1959	0	1015	390	0	0	0
1961	0	0	0	0	0	0
1962	0	0	0	0	0	0
1963	0	0	0	0	0	0
1964	0	0	0	0	0	0
1965	0	0	0	0	0	0
TOTAL	0	1015	390	0	0	0

Figure 9. Screenshot of “Annual Dose Summary” Report Showing External Monitoring from 1963 to 1965

Discussion:

As noted above, the claimant was monitored at INL from 1963 to 1965 per the “annual dose summaries”; however, the individual dosimetry records were not included in the supplemental records request and so are assumed not available. Internal records during this period indicate that the main work area was “CFA”; however, given that the occupation was “[REDACTED],” this is not surprising. The CATI with the EE’s survivor states that the [REDACTED] itself was in “TRA and CPP” and that the EE was involved in cleanup activities. Since the “box and record listing” was not included in the file, it is not possible to determine if all known records for the individual were available. While SC&A did not find any evidence that the claimant was exposed at CPP during the proposed SEC period, the exact work location based on external monitoring results from 1963 to 1965 is not available.

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Observation 6: The “annual dose summary” report for Case #6 indicates that the claimant was monitored from 1963 to 1966; however, individual dosimetry reports are not available to ascertain the exact work location during this time.

2.7 CASE #7: CLAIM [REDACTED]

Covered Employment		Job Title(s)
Start	End	
[REDACTED]/1959	[REDACTED]/1963	Health Physicist
[REDACTED]/1964	[REDACTED]/1964	
[REDACTED]/1964	[REDACTED]/1965	
[REDACTED]/1965	[REDACTED]/1966	

Original Comments and Rationale for Selection Claims (SC&A 2015):

- LFC indicates assignment to Materials Test Reactor (MTR) and NRF during the proposed SEC period
- External monitoring results are associated with MTR and CFA.
- One Whole-Body Count Questionnaire indicated that there was no work in any other area.
- CATI with the EE mentions incidents at CPP in the 1959–1963 period, although more specific dates were not provided.

Review Comments based on Supplemental Data Requests:

- Part of the supplemental dosimetry file contains logbook entries that are undated and do not have column headers. These were determined to be associated with the SL-1 incident via comparison with dose totals from alternately formatted dosimetry records (see Case #4, Observation 4).
- Internal dosimetry in 1963 (one of the incident years mentioned) was related to MTR and CFA.
- No evidence of an incident was observed in the supplemental dosimetry records, and no monitoring was identified at CPP during any period.
- No “box and record listing” is available for this claimant.

Discussion:

Although the claimant mentions incidents at CPP that may have occurred in the first year of the proposed SEC period, SC&A could find no indication in the supplementary dosimetry records that any incidents were documented involving the EE at that location. Internal and external monitoring suggests that the claimant was working in the MTR and CFA areas during the proposed SEC period. Since the “box and record listing” was not included in the file, it is not possible to determine if all known records for the individual were available. SC&A did not find direct evidence to suggest the claimant was exposed at CPP during the proposed SEC period.

2.8 CASE #8: CLAIM [REDACTED]

Covered Employment		Job Title(s)
Start	End	
Two Additional Employment Periods Prior to the SEC Period		Ironworker
[REDACTED]/1963	[REDACTED]/1963	
[REDACTED]/1966	[REDACTED]/1966	
[REDACTED]/1969	[REDACTED]/1970	
[REDACTED]/1970	[REDACTED]1970	
Five Additional Employment Periods After the SEC Period		

Original Comments and Rationale for Selection Claims (SC&A 2015):

- CATI with the EE:
 - “Argonne, CPP, Westinghouse, EBR I & II, burial grounds, north end, central facilities.”
 - Indicates the use of anti-contamination clothing and respirators while working at CPP.
 - Notes that [the EE] did not wear a film badge, but did use a pencil dosimeter.
- No LFC was available for the claimant.

Review Comments based on Supplemental Data Requests:

- LFC indicates that parts of 1963 were associated with work at the NRF and “AX” (construction at Test Area North).
- Available dosimetry reflects work at “AX” in 1963.
- The annual dose summaries indicate monitoring occurred in 1970 and 1971, though it is unknown if this includes NRF employment.
- Three separate employment periods with Arrington Construction are indicated in 1969 and 1970; however, no area is specified. Starting in August 1970, the LFC indicates assignment to NRF.
- Temporary badges were issued for CPP in 1984 and 1985.
- A “Box and Record List” was included in the claimant’s file. All listed records contained in the file were also included in the claimant’s dosimetry file.

Discussion:

The claimant describes working at CPP during employment, but does not specify when that work may have occurred. Based on the available temporary dosimetry badges, the claimant did work at CPP, but not during the SEC period (the temporary badges were in the 1980s). The only available monitoring during the proposed SEC period was associated with construction in the TAN area. Review of the “box and record list” indicates that all known records for the claimant

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have been obtained and transmitted to NIOSH. SC&A did not find direct evidence to suggest the claimant was exposed at CPP during the proposed SEC period

2.9 CASE #9: CLAIM █████

Covered Employment		Job Title(s)
Start	End	
█████/1962	█████/1963	Electrical Engineer

Original Comments and Rationale for Selection Claims (SC&A 2015):

- LFC does not indicate an assigned area or employer.
- CATI with EE states: “MTR, [Engineering Test Reactor], ATR, reactor sites, sodium reactor facility.”
- Internal monitoring data available for MTR and CFA.
- A termination in-vivo questionnaire for MTR indicates “no other areas worked.”
- From the Department of Labor (DOL) Initial Case: “Worked as an electrical engineer performing glove box design, assisting with installation, troubleshooting [sic], modifications, etc. during the spent metal reduction program. As an electrical engineer spent time with various electrical systems throughout the facility.”
- Only annual dose summary records area are available.

Review Comments based on Supplemental Data Requests:

- Dosimetry records were provided which show consistent monitoring at MTR during 1963.
- One additional visitor badge associated with TAN identified during 1963.
- No “box and record listing” is available for this claimant.

Discussion:

As noted in the “Original Comments” section, the previously available claimant records did not directly indicate work at CPP, nor did the CATI report. However, based on the fact that only annual dose summaries were originally available and the statements in the DOL Initial case indicated involvement in the spent metal reduction program (location not specified) and that electrical work was “all over the site,” it was determined the possibility existed that the EE spent at least some time in the CPP. However, specific dosimetry records were received from INL as a result of the supplemental data request and they indicated continuous external monitoring at MTR, with a single visit to TAN during the 1963 period. Since the “box and record listing” was not included in the file, it is not possible to determine if all known records for the individual were available. SC&A found no evidence to suggest the EE was potentially exposed at CPP during the SEC period.

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2.10 CASE #10: CLAIM [REDACTED]

Covered Employment		Job Title(s)
Start	End	
[REDACTED]/1969	[REDACTED]/1987	Journeyman Roofer
Nine Additional Employment Periods After the SEC Period		

Original Comments and Rationale for Selection Claims (SC&A 2015):

- CATI report with the EE describes an incident in the early 1970s that took place at CPP while working on the roof.
- Incident Description: “There were two times when they had their clothes and shoes taken from them because of contamination being found when they went through the monitoring as they exited a job. They also had a truck and other equipment taken to be cleaned up.”
- Claimant states that external badging was intermittent.
- DOE Response files indicate external monitoring did not begin until 1975.

Review Comments based on Supplemental Data Requests:

- LFC indicates assignment to CPP for at least 2 days in 1975 (8/25/1975 and 9/3/1975).
- Visitor dosimetry badges for CPP are available for 9/3/1975 and 11/25/1975.
- Regular dosimetry badge reports for CPP are available for cycles ending on 8/31/1975 and 9/30/1975.
 - “HP Request” was indicated under “reason code” for these dosimeters.
 - Entries contain a “V” immediately after the area code designation, which likely represents that they were “visitor badges.”
- A “Box and Record List” was included in the claimant’s file. All listed records contained in the file were also included in the claimant’s dosimetry file.

Discussion:

The claimant does describe an incident in the “early 1970s” which can be assumed to reflect the visitor badges issued for the EE in 1975. Additionally, the incident is described as occurring on the roof and the actual badges indicate they were associated with CPP construction, which could reasonably be envisioned occurring on the roof. Comparison of the “box and record list” against the actual records transmitted in the supplemental data request indicates that all known records for the claimant were located. Thus, SC&A did not find any direct evidence that exposure may have occurred at CPP during the proposed SEC period.

2.11 CASE #11: CLAIM [REDACTED]

Covered Employment		Job Title(s)
Start	End	
[REDACTED]/1953	[REDACTED]/1967	[REDACTED]

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Original Comments and Rationale for Selection Claims (SC&A 2015):

- Claimant has external monitoring records associated with the MTR during the SEC period.
- CATI with survivor did not know the specific work location.
- In-vivo questionnaire dated 3/31/1967 indicates the EE also worked at CPP for 18 months, but does not indicate the exact timeframe. Record indicates the contractor was “██████████.”

Review Comments based on Supplemental Data Requests:

- LFC:
 - Indicates assignment to MTR for parts of 1966–1967.
 - Also indicates employment in 1970 and 1971, although no area is given and the contractor entry is illegible (security badge records indicate the employers were ██████████ and ██████████).
- All external dosimetry during the covered SEC employment period was associated with MTR, and the records appear complete and continuous.
- The EE had the following four external dosimetry records associated with CPP:
 - 3/29/1958: result labelled “not in area”
 - 4/5/1958: result labelled “not in area”
 - 4/17/1958: positive results listed
 - 12/4/1958: record labelled “H.P. Request”
- Dosimetry prior to March 1958 was labelled as “CFA.”
- A “Box and Record List” was included in the claimant’s file. All listed files (including over 400 pages of individual records) contained in the “box and record list” were verified as being included in the claimant’s dosimetry file.

Discussion:

The main piece of evidence provided in the original claim review was the whole-body count questionnaire from 1967, which indicated the EE spent 18 months at CPP. Unfortunately, the questionnaire does not prompt for specific dates to indicate when this employment actually occurred. The fact that the claimant was monitored externally at CPP in 1958 could potentially explain this unknown 18-month work period at CPP. As was noted, prior to these results, the dosimetry was related to CFA. It is not known if the “one badge–one area” badging policy was in place prior to 1958. It may be possible that a job title such as “██████████” would be badged out of CFA, but would occasionally have to enter other areas as needed. All other evidence suggests the claimant was monitored continuously at MTR during the period of interest. SC&A’s review of over 400 references provided in the “box and record list” indicated that no known records

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were able to be located. Therefore, SC&A could find no direct evidence that the EE was potentially exposed at CPP during the proposed SEC period.

2.12 CASE #12: CLAIM █████

Covered Employment		Job Title(s)
Start	End	
Two Additional Employment Periods Prior to the SEC		Electrical Workers
█████/1963	█████/1963	
█████/1965	█████/1965	
█████1965	█████/1965	
█████/1965	█████/1965	
█████/1969	█████/1969	
█████/1970	█████/1970	
Seven Additional Employment Periods After the SEC		

Original Comments and Rationale for Selection Claims (SC&A 2015):

- DOE Response indicates external monitoring ended in 1963.
- No LFC was available.
- CATI with survivor: "Building/Location: INEL: CPP, RWMC, TAN, MRF, GERT, GET, EBR2, NRF: █████ for Power Line Construction, Outside Work, Posting Transmission Posts and Stringing the Wire."

Review Comments based on Supplemental Data Requests:

- LFC:
 - Indicates assignment to TAN construction during parts of 1963.
 - Hire dates in 1969 and 1970 were indicated, but no external dosimetry and/or termination dates were provided.
 - Employer during these latter years is listed as "Miscellaneous Contractors."
- Monitoring began again in 1986 and lists "INT" as one of the areas. This could potentially represent "INTEC" or the Idaho Nuclear Technology and Engineering Center (formerly the CPP).
- No "box and record listing" is available for this claimant.

Discussion:

The main reason for requesting follow-up data capture for this claimant was that there was no LFC available and no individual dosimeter results for 1963. Supplemental data request provided a single dosimetry sheet associated with construction in the TAN area. The CATI with the EE's survivor did list CPP among several other facilities located at the INL site; however, no dates were provided. One possibility is that the latter dosimetry records beginning in the mid-1980s actually represent INTEC, or the current name of the CPP. There was no "box and record listing"

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file provided for the claimant, so it is not possible to determine if any particular records could not be located. SC&A found no direct evidence of exposure at CPP during the proposed SEC period.

2.13 CASE #13: CLAIM [REDACTED]

Covered Employment		Job Title(s)
Start	End	
[REDACTED]/1967	[REDACTED]/1967	Teamster/Warehouseman
[REDACTED]/1972	[REDACTED]/1972	
7 Additional Employment Periods After SEC-Period		

Original Comments and Rationale for Selection Claims (SC&A 2015):

- DOE Response indicates monitoring did not begin until 1986.
- CATI with EE:
 - “Building/Location: CPP (chemical processing plant) 698... Routine job duties: Went into areas to pick up safe work permits. Shipping and receiving supplies.”
 - States that no badges were worn, but the EE was routinely frisked and area surveys were undertaken.
- LFC does not contain information until 1986 when CPP is listed.

Review Comments based on Supplemental Data Requests:

- Employment in the earlier two periods was established based on security badges issued by Arrington Construction and the Kellog Co.
- Temporary film badges for CPP in 1982³ and 1985.
- Dosimetry printouts beginning in 1986 indicate dual badging at TRA and “INT” (assumed to represent INTEC).
- A “Box and Record List” was included in the claimant’s file. All listed records contained in the file were also included in the claimant’s dosimetry file.

Discussion:

Although the claimant states in the CATI report that the sole work location was at CPP, no actual dates were provided. Evidence suggests that the EE was monitored as a visitor and then on a regular basis at CPP during the 1980s. No evidence of work location or radiation monitoring (external or internal) during the brief period of covered employment in 1967 and 1972 was identified. Based on the “box and record listing,” it appears that all known records involving the EE were able to be located. Therefore, SC&A found no evidence that the claimant was exposed at CPP during the proposed SEC period.

³ Area designation on 1982 temporary badge has some legibility issues; SC&A has assumed it is also for CPP, based on what is available.

2.14 CASE #14: CLAIM [REDACTED]

Covered Employment		Job Title(s)
Start	End	
[REDACTED]/1953	[REDACTED]/1954	Carpenter
[REDACTED]/1963	[REDACTED]/1963	
[REDACTED]/1963	[REDACTED]/1963	
[REDACTED]1964	[REDACTED]1964	
[REDACTED]/1964	[REDACTED]/1964	
[REDACTED]/1973	[REDACTED]/1976	
Four Additional Employment Periods After SEC Period		

Original Comments and Rationale for Selection Claims (SC&A 2015):

- DOE Response indicates the claimant was not monitored at INL.
- No LFC could be located for the EE.
- CATI with survivor:
 - Work Location: “Test Reactor Area, Chemical Processing Plant, Experimental Breeder Reactor, Test Area North.”
 - “Exposure depended on which building [the EE] was in; however, [the EE] mostly worked in radiation zones and had to be monitored on [the EE’s] way out of the zone... and building scaffolding, worked in pipe tunnels, and [the EE] worked around pool areas where they kept radiated fuel.”

Review Comments based on Supplemental Data Requests:

- Supplemental data requests provided two visitor badges for the EE in 1975 for the Radioactive Waste Management Complex (RWMC).
- Additional visitor badge labelled as “Area 201⁴” in 1978.
- No other dosimetry or LFC were provided.
- No “box and record listing” is available for this claimant.

Discussion:

As noted above, the survivor of the EE listed CPP as one of the work areas that the claimant was located during the covered employment. However, aside from three visitor badges found in the 1970s (after the proposed SEC period), there is no evidence to indicate the EE’s work area at INL. There was no “box and record listing” file provided for the claimant, so it is not possible to determine if any particular records could not be located. SC&A has found no direct evidence that the claimant was exposed at CPP either during or outside the proposed SEC period.

⁴ Assumed to be EBR-II based on a handwritten note contained in the margin of the scanned visitor badge.

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2.15 CASE #15: CLAIM [REDACTED]

Covered Employment		Job Title(s)
Start	End	
[REDACTED]/1972	[REDACTED]/1993	[REDACTED]

Original Comments and Rationale for Selection Claims (SC&A 2015):

- Only a career dose was available for this claimant.
- LFC indicates assignment to CPP for the period of 8/10/1972 to 5/6/1975 and also indicates “TLD” during this period.
- CATI with survivor: “Building/Location: CFA-690 (Central Facility) and throughout the INEL Site as required.”

Review Comments based on Supplemental Data Requests:

- Regular monitoring began with a cycle for July 1972 and continued through the relevant proposed SEC period; all badges were associated with CFA.
- Claim has one regular area exposure report for CPP ending in May 1975.
- Claim has a visitor badge at CPP in November 1973.
- No “box and record listing” is available for this claimant.

Discussion:

Although there is direct evidence of the claimant being assigned to CPP during the relevant covered employment during the SEC and only a single visitor badge for the area, this is not unexpected, since the site policies at the time had switched from “one badge–one area” to “one badge–multiple areas.” Therefore, it is assumed the claimant simply took the applicable CFA badge and was able to enter CPP without obtaining a new badge. There was no “box and record listing” file provided for the claimant, so it is not possible to determine if any particular records could not be located. SC&A did not find evidence to suggest that the claimant was exposed at CPP and would be inadvertently excluded by the currently proposed SEC class definition requirements.

2.16 CASE #16: CLAIM [REDACTED]

Covered Employment		Job Title(s)
Start	End	
[REDACTED]/1951	[REDACTED]/1951	Insulator [REDACTED], Asbestos Worker
[REDACTED]/1964	[REDACTED]/1964	
[REDACTED]/1964	[REDACTED]/1964	
[REDACTED]/1974	[REDACTED]/1974	
[REDACTED]/1974	[REDACTED]/1977	
[REDACTED]/1977	[REDACTED]/1977	
[REDACTED]/1977	[REDACTED]/1979	

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Original Comments and Rationale for Selection Claims (SC&A 2015):

- LFC:
 - Only indicates assignment to NRF during the SEC period, although there are several entries that do not indicate a specific work area.
 - Assigned to CPP in 1975.
- CATI report with survivors mentions CPP in an incident involving the EE, although the date of the incident was only given as “1961–1979”
- Dosimetry result for “OX” (construction near the Organically Moderated Reactor Experiment (OMRE)) in January of 1963. Covered employment in this year is attributed to ANL-W.

Review Comments based on Supplemental Data Requests:

- Five visitor badges were found in the 1967 and 1968 timeframe with no area specified. These badging periods match up with assignments to NRF found on the LFC.
- Positive external exposure observed in 1974 was associated with a brief visit to TRA.
- Regular dosimetry records found for the EE in 1975 for CPP.
- Additional visitor badges for CPP in 1975, 1977 and 1978.
- No “box and record listing” is available for this claimant.

Discussion:

The CATI report with the survivors indicated there was an incident that occurred at CPP during the 1961–1979 time period. The LFC as well as regular/visitor badging indicates the EE was potentially exposed at CPP beginning in 1975. Evidence prior to this year indicates work areas such as construction at the OMRE area, a single visit to TRA, and multiple visits to NRF. There was no “box and record listing” file provided for the claimant, so it is not possible to determine if any particular records could not be located. SC&A did not find evidence to suggest that the claimant was potentially exposed at CPP during the proposed SEC period.

2.17 CASE #17: CLAIM [REDACTED]

Covered Employment		Job Title(s)
Start	End	
[REDACTED]/1964	[REDACTED]/1964	Plumber/Pipefitter
[REDACTED]/1964	[REDACTED]/1964	
[REDACTED]/1966	[REDACTED]/1967	
[REDACTED]/1968	[REDACTED]/1968	
[REDACTED]/1968	[REDACTED]/1969	
[REDACTED]/1969	[REDACTED]/1970	
[REDACTED]/1973	[REDACTED]/1973	
[REDACTED]/1973	[REDACTED]/1973	
[REDACTED]/1974	[REDACTED]/1975	
12 Additional Employment Periods After the SEC Period		

Original Comments and Rationale for Selection Claims (SC&A 2015):

- Career dose totals indicate work from 1963 to 1970 was actually at ANL-W.
- LFC indicates several employment periods without a location specified (the only entries that specified a location were for ANL-W).
- Claimant was monitored at CPP during the latter SEC period (1970–1974), but did not have 250 days of covered employment.
- CATI with survivor did not know the EE’s work location.

Review Comments based on Supplemental Data Requests:

- No additional information was identified to indicate a specific work location for employment periods (1963–1970) that were not specifically labelled as “ANL-W.”
- No “box and record listing” is available for this claimant.

Discussion:

Since no additional information was identified in the supplemental data request, SC&A has found no evidence, direct or anecdotal, that the claimant was potentially exposed at CPP during the earlier SEC period (1963–1970). The EE was monitored at CPP during the latter SEC period; however, the EE did not meet the 250-day SEC requirement. There was no “box and record listing” file provided for the claimant, so it is not possible to determine if any particular records could not be located.

2.18 CASE #18: CLAIM [REDACTED]

Covered Employment		Job Title(s)
Start	End	
[REDACTED]/1963	[REDACTED]/1963	Painter
[REDACTED]/1963	[REDACTED]/1963	
Three Additional Employment Periods After the SEC Period		

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Original Comments and Rationale for Selection Claims (SC&A 2015):

- DOE Response indicates the claimant was not monitored at INL.
- CATI with EE states that the work location was “Breeder reactor bldg., INTEC” (Idaho Nuclear Technology and Engineering Complex).

Review Comments based on Supplemental Data Requests:

- Supplemental data request affirms that the claimant was not monitored at INL.
- Security records do not list an employer for the covered employment periods during the proposed SEC period.
- No “box and record listing” is available for this claimant.

Discussion:

The CATI report with the EE indicated that one of the work locations was INTEC (Idaho Nuclear Technology and Engineering Complex), which is the current name for the CPP. Supplemental data requests affirmed that the EE was not monitored at INL at any time. There was no “box and record listing” file provided for the claimant; however, this would be expected for an EE who was not monitored at any time at INL. SC&A found no evidence that the claimant was potentially exposed at CPP during the proposed SEC period.

3.0 SUMMARY RECOMMENDATION

Based on our exhaustive review of dosimetry and worker placement data for the INL claimant population, SC&A believes that the probability of incorrectly excluding a claimant from the proposed SEC class based on the current external dosimetry requirements remains small but real. Based on SC&A’s review of the 18 total claims jointly identified by NIOSH and SC&A, there remains some uncertainty regarding the efficacy of the class definition. For example, one of the 18 claims exhibited evidence that at least one of the records related to the EE could not be located (see Observation 1). In two other examples, internal monitoring (specifically in vivo) indicated entrance into CPP, though the required external dosimetry was not provided and/or available (see Observations 2 and 3). Finally, one of the 18 claims indicated external monitoring for some years during the SEC for which individual dosimeter logs, which would allow for placement of the worker in a given area, were not provided and/or available (see Observation 6). Therefore, at this time SC&A is unable to validate the efficacy of the currently proposed class definition, despite the substantial effort put forth in the entirety of the INL SEC studies.

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