



National Institute for Occupational Safety and Health (NIOSH) Assessment of Savannah River Site Dose Reconstruction Capability (1991–2007)

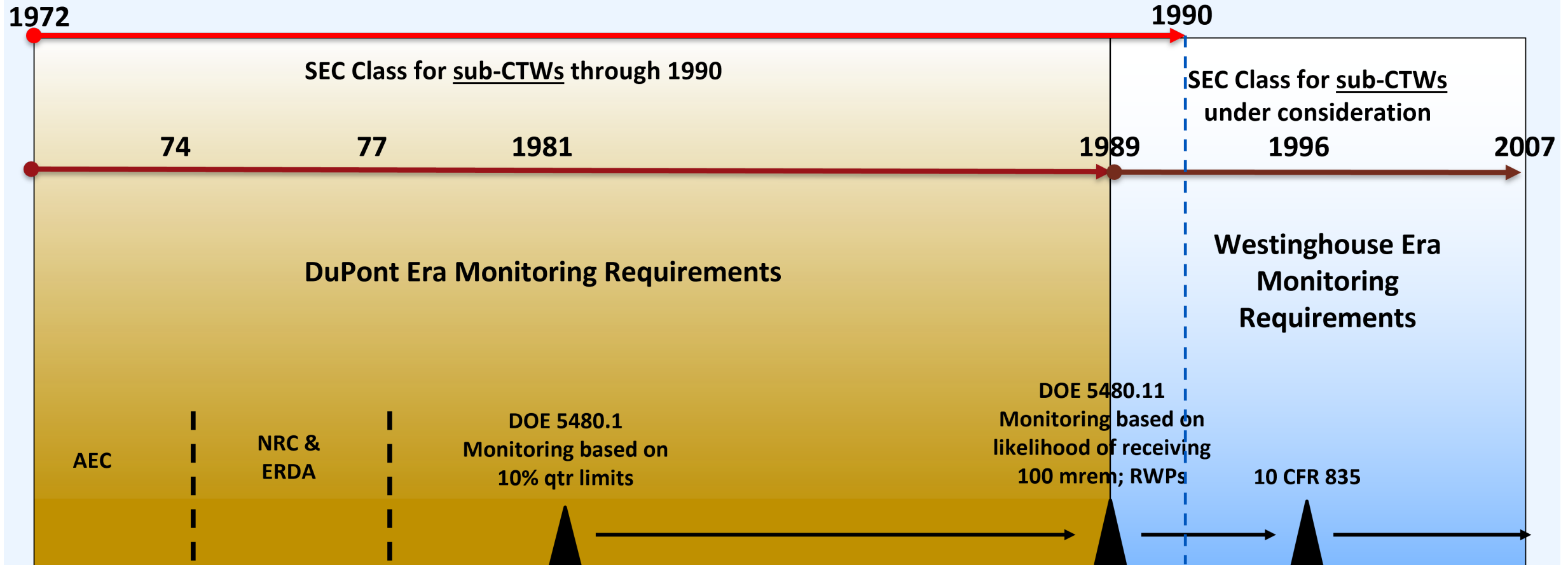
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Division of Compensation Analysis and Support

Advisory Board on Radiation and Worker Health (ABRWH) Meeting

April 29, 2026

SRS SEC Petition 103 Timeline for sub-CTWS



SRS: Savannah River Site

sub-CTWs: Subcontractor Construction Trades Workers

NRC: Nuclear Regulatory Commission

DOE: Department of Energy

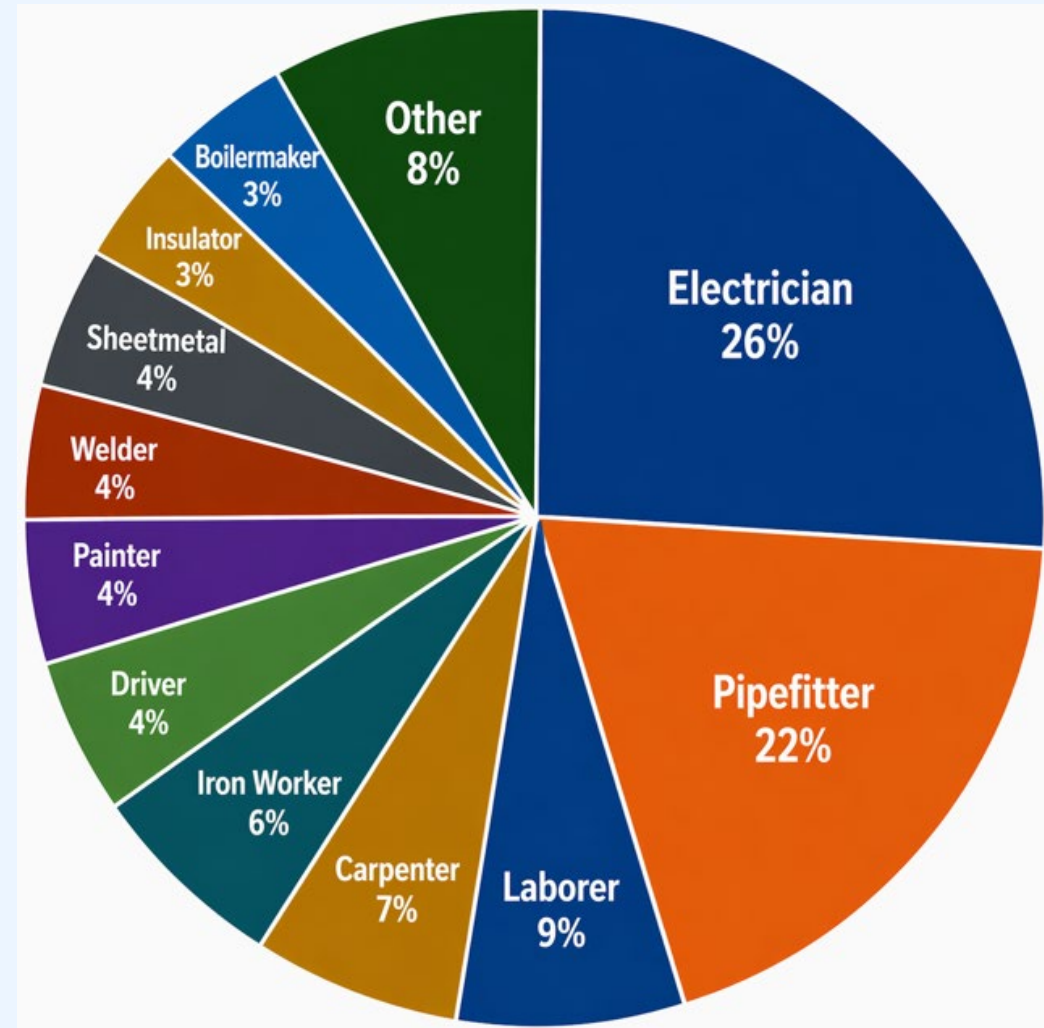
SEC: Special Exposure Cohort AEC: Atomic Energy Commission

ERDA: Energy Research and Development Administration

RWPs: Radiation Work Permits

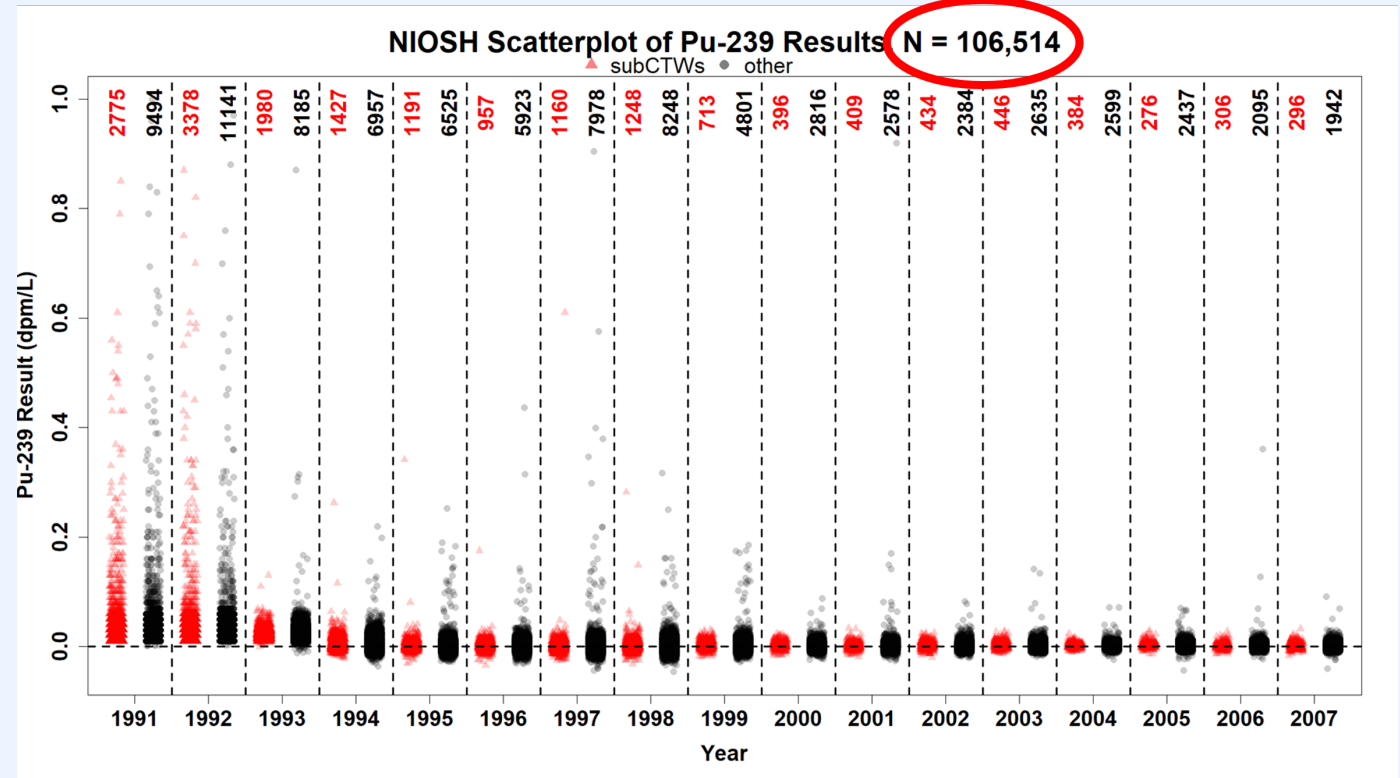
Dose Reconstruction Feasibility for sub-CTWs

- NIOSH has consistently maintained that **dose reconstruction is feasible beginning in 1991**
- Data considered **comprehensive and representative for dose reconstruction purposes**
- Dose reconstruction can be performed using **co-exposure models and established methods**
- This position has remained unchanged across multiple SRS Work Group (WG) discussions for over a decade



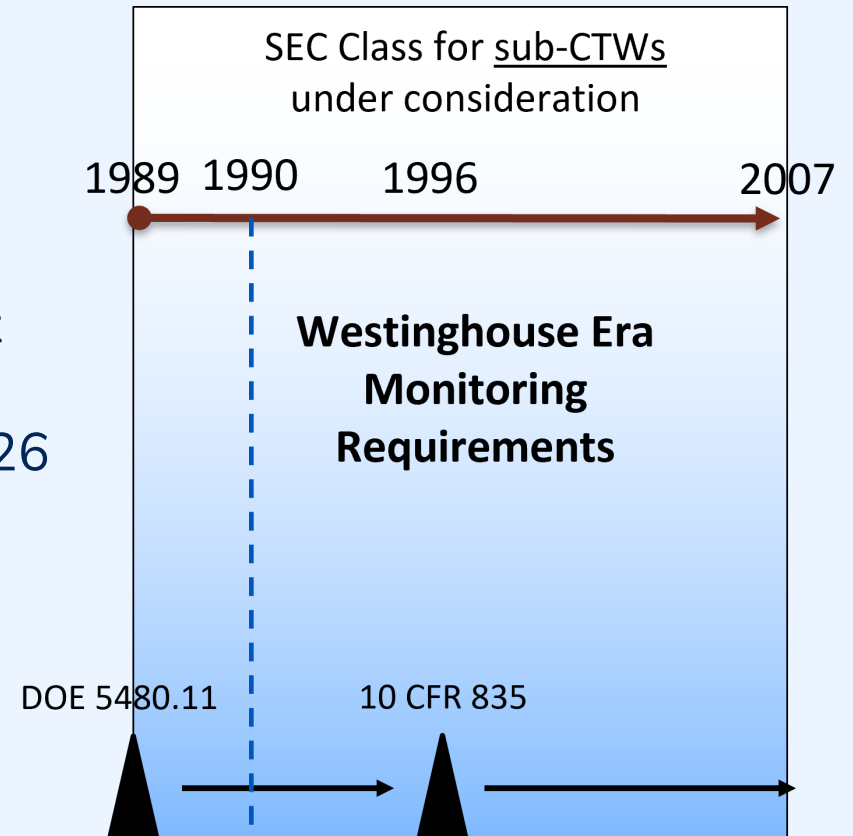
Extensive Data Availability at SRS

- Analyses rely on **tens of thousands to over 100,000 high quality bioassay and monitoring results**
- Data span multiple pathways (bioassay, dosimetry, incident tracking)
- Work group discussion used adjectives such as phenomenal, incredible, and first rate to describe the SRS database and monitoring program during the 1990s. (SRS WG 3/17/26 transcript p. 29)

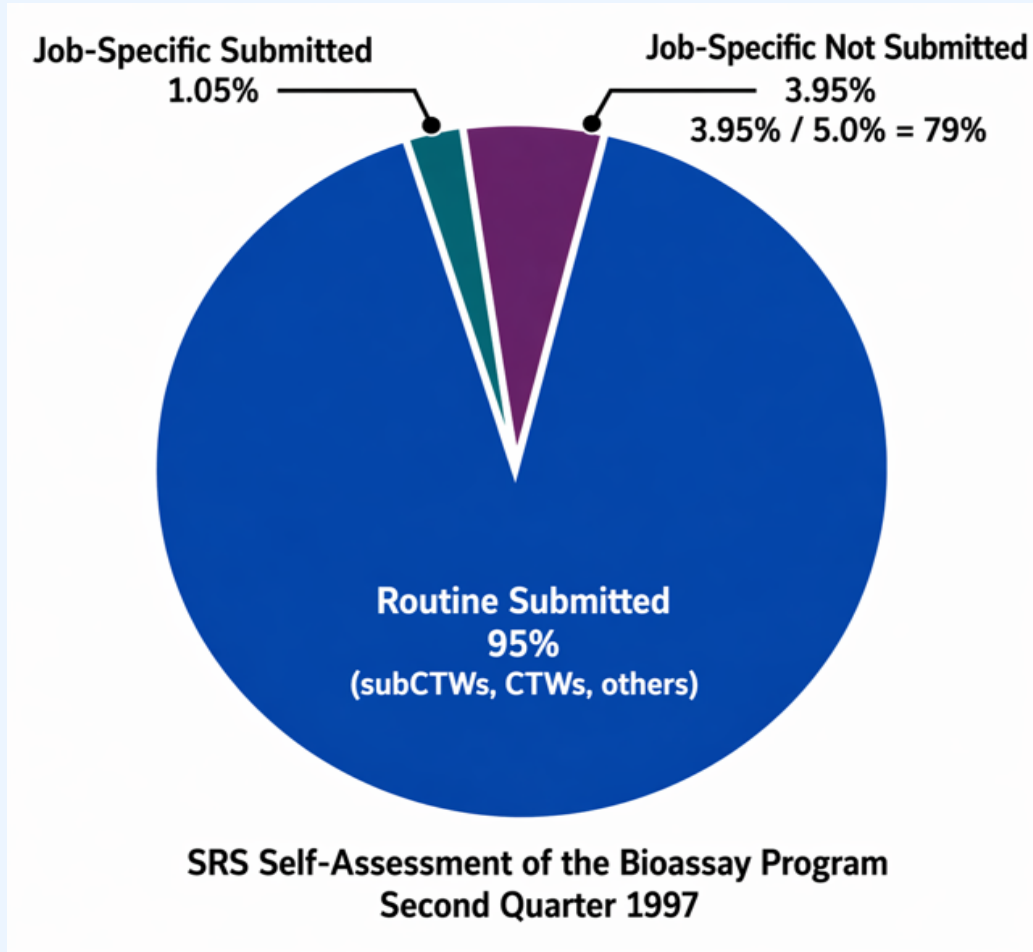


Dose reconstruction can be performed with sufficient accuracy

A majority of the work group expressed confidence that **dose reconstruction can be performed in scientifically sound manner** from 1991 and beyond. (SRS WG 3/17/26 transcript pages 29 and 30)



1997 Q2 SRS Self-Assessment of Job-Specific Bioassay Program



Total Submitted = 96.05%

Total Not Submitted = 3.95%

For 1997, a total of 10,889 samples were requested. All individuals (N=256) that did not submit a job-specific bioassay were later sampled and none had an uptake of radioactive material.

1990 DOE Tiger Team Report Findings

- SRS had an established collection and lab infrastructure
- Rapid analytical capabilities, especially for tritium
- Formal procedures and policies
- Tracking and administrative controls
- Defined roles and responsibilities
- Integration into a larger, comprehensive monitoring system.
- The SRS SEC for sub-CTWs already goes through 31 December 1990

Low Dose Environment in the Modern Era (>1990)

- DOE 5480.11 and 10 CFR 835 required monitoring for any workers likely to receive **100 millirem in a year starting in 1990.**

Work group discussion noted that for exposures below 100 millirem the chances of adverse outcomes are very small in relationship to cancer risk.

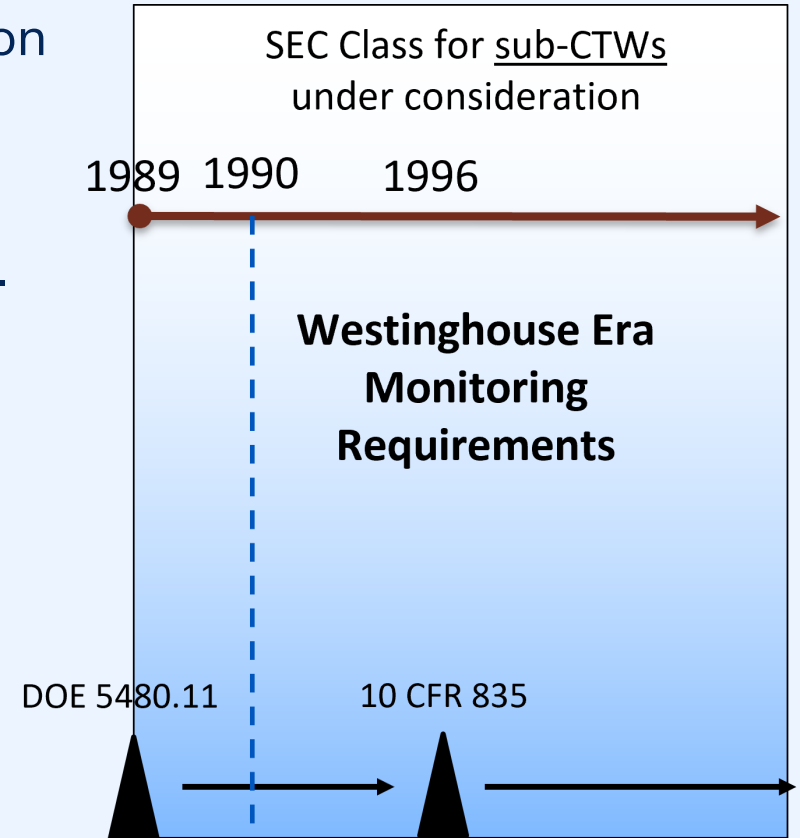
(SRS WG 3/17/26 transcript p. 29)

Year	Avg Dose (mrem)	SRDB ¹ #	Page #
1991	16	175283	306
1992	15	175284	639
1993	15	175285	141
1994	22.4	175286	142
1995	18	175287	87
1996	15	175288	72
1997	13	167672	12

¹SRDB: Site Research Database

Reason for Elevating to the Full Advisory Board

- The WG was concerned about the length of the SEC evaluation period (SRS WG 3/17/26 transcript p. 29)
 - NIOSH Evaluation Report completed on 11/20/2012
- Work group discussion shifted to public policy considerations. (SRS WG 3/17/26 transcript p. 30)
- Work group passed a motion to extend the SEC to the end of 1993 and bring this issue to the full board for discussion and conclusion



NIOSH Response to SC&A Observation 4

- There were no significant differences noted in the effective percent monitored between subCTW plutonium bioassays by craft for 1990–1998 as shown in the table below.

Craft	Bioassay Required	No. of RWP	subCTWs Monitored	Percentage with Bioassay	SubCTWs Matched to Coworkers	Effectively Monitored %
Boilermaker	27	12	24	89%	2	96%
Carpenter	79	33	71	90%	7	99%
Electrician	56	24	49	88%	2	91%
Insulator	17	9	16	94%	0	94%
Iron/Sheet metal	137	33	122	89%	12	98%
Laborer	174	70	147	84%	14	93%
Millwright	15	6	13	87%	2	100%
Painter	22	12	17	77%	4	95%
Pipefitter	102	42	94	92%	4	96%
Other	15	8	14	93%	0	93%
Totals	644	140	567	88%	47	95%

Presented to SRS WG on 17 November 2020

1991 – 1998 sub-CTW Plutonium Monitoring Evaluation

Year	Bioassay Required	No of RWPs	SubCTW monitored	% with bioassay	SubCTWs matched to Coworker	Effective % monitored
1991	82	17	78	95%	3	99%
1992	88	23	85	97%	3	100%
1993	173	27	154	89%	11	95%
1994	140	32	104	74%	20	89%
1995	57	15	52	91%	5	100%
1996	24	7	20	83%	0	83%
1997	55	9	54	98%	1	100%
1998	25	10	20	80%	4	96%
Total	644	140	567	88%	47	95%

1990-1998 Subcontractor Bioassay Monitoring by Radionuclide

Radionuclide	Bioassay required	SubCTWs monitored	% with bioassay	SubCTWs matched to Coworker with bioassay	% monitored or matched with a coworker
Plutonium	644	567	88%	47	95%
Strontium	429	414	97%	12	99%
Uranium	225	199	88%	17	96%
Americium	180	131	73%	25	87%
Neptunium	91	63	69%	13	84%
Total	1569	1374	88%	114	95%

Extending the sub-CTW SEC Recommendation beyond 1990 (1 of 3)

- Basis for the 1972 – 1990 recommendation
- “Subcontractor construction trades workers conducted a broad range of work activities supporting research, fuel handling, transuranic material processing and separation, decontamination and decommissioning, and reactor outages. They may have worked in high-contamination and high-airborne radioactivity areas and may have been utilized for short-term high-exposure work tasks.”
- Narrative describes sub-CTWs as performing high-exposure work; however, NIOSH data (1991–2007) do not indicate they were among the most highly exposed workers
 - SRDB 205228, 20 May 2024
- Basis for extending SEC is not supported by the available exposure data

Extending the sub-CTW SEC Recommendation beyond 1990 (2 of 3)

- Basis for the 1972 – 1990 recommendation
- “The Board finds there to be insufficient information, including a lack of job-specific radio-bioassay monitoring data for subcontractor construction trades workers, and assurance of workplace monitoring and source term data, to enable NIOSH to estimate with sufficient accuracy all potential internal doses from radionuclides associated with fuel handling, reactor operations, fuel reprocessing, and/or research activities, to which the proposed class may have been exposed during the time period in question.”
- NIOSH notes:
 - A job-specific bioassay program did not exist until 1992, yet the Board’s justification implied data existed but was insufficient
 - Unclear why the board relied on job-specific bioassay data to justify an SEC for a period when no such data were generated.
 - Extensive data does exist to reconstruction sub-CTW doses in the 1990s.
 - 1989 implementation of DOE Order 5480.11 (100 millirem)
 - Transition period from 1/1/1989 through 12/31/1990 is built in the existing SEC for sub-CTWs.

Extending the sub-CTW SEC Recommendation beyond 1990 (3 of 3)

- Basis for the 1972 – 1990 recommendation
- “The Board determined that health may have been endangered for subcontractor construction trades workers exposed to radiation at the SRS during the time period in question.”
- SRS work group discussed this.
 - Average doses were below 100 mrem per year in the 1990s.
 - SRS WG (3/17/2026) discussion noted that at exposures below 100 millirem per year, the chances of an adverse outcome are very small in relationship to cancer risk.
- Available dose data post-1990 appear inconsistent with the level of risk implied.

Framework for SEC Determination

- 42 U.S.C 7384q – Designation of additional members of Special Exposure Cohort
- A class may be added to SEC if:
 - Dose reconstruction is not feasible with sufficient accuracy, and
 - There is a reasonable likelihood that radiation exposure may have endangered health
- No additional factors (e.g., policy considerations) are identified in the statute

NIOSH Takeaways for Board Consideration

- Dose reconstruction: **NIOSH concludes dose reconstruction is feasible post-1990** (e.g., no extension of SEC)
- Data: **Extensive and widely viewed as robust**
- Doses: **Low, much lower than the 100 millirem monitoring requirement**
- Consensus: **Majority of work group support feasibility of dose reconstruction**
- Work group discussion to extend the SEC was not based on the lack of availability of data but was based on their view that public policy was a balancing factor to justify extending the SEC beyond strict scientific conclusions

Thank you.

For more information, contact CDC

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