



Bioassay for Subcontractor Construction Trade Workers at the Savannah River Site from 1972 to 1997

John Cardarelli II, PhD, CHP, CIH, PE

Research Health Physicist, NIOSH

Roger Halsey, CHP

Health Physicist, Oak Ridge Associated Universities Team

SRS Workgroup Meeting

March 23, 2021

Overview

- Purpose of ORAUT-RPRT-0094
- Results
- Conclusions

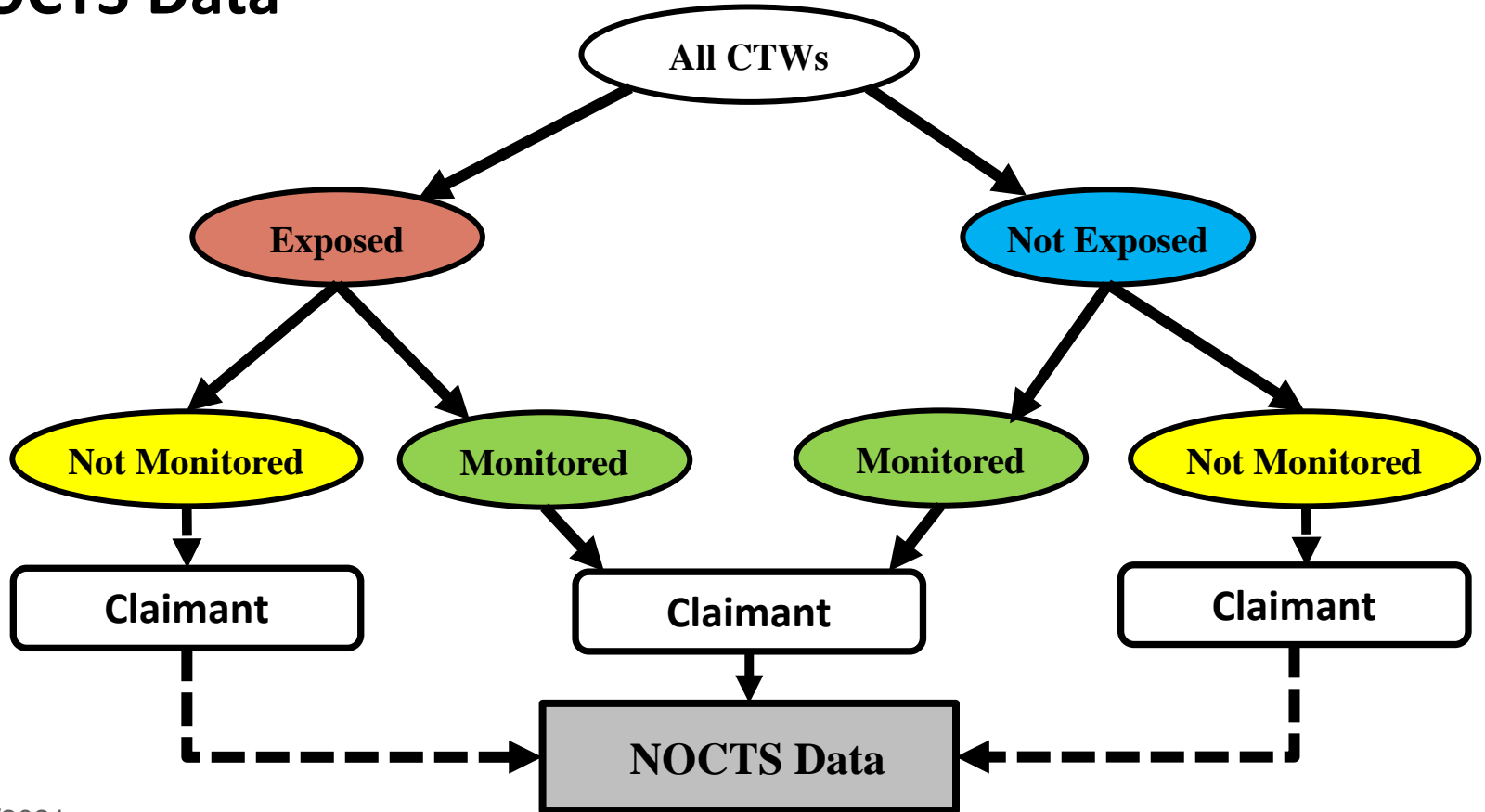
Purpose

ORAUT-RPRT-0094

Purpose

- To extend the period of evaluation for SRS subcontractor bioassay **data completeness** from 1989-1998 to 1972-1997.
- Only NOCTS Data
- Understand trends associated with radiological monitoring of subCTWs

NOCTS Data

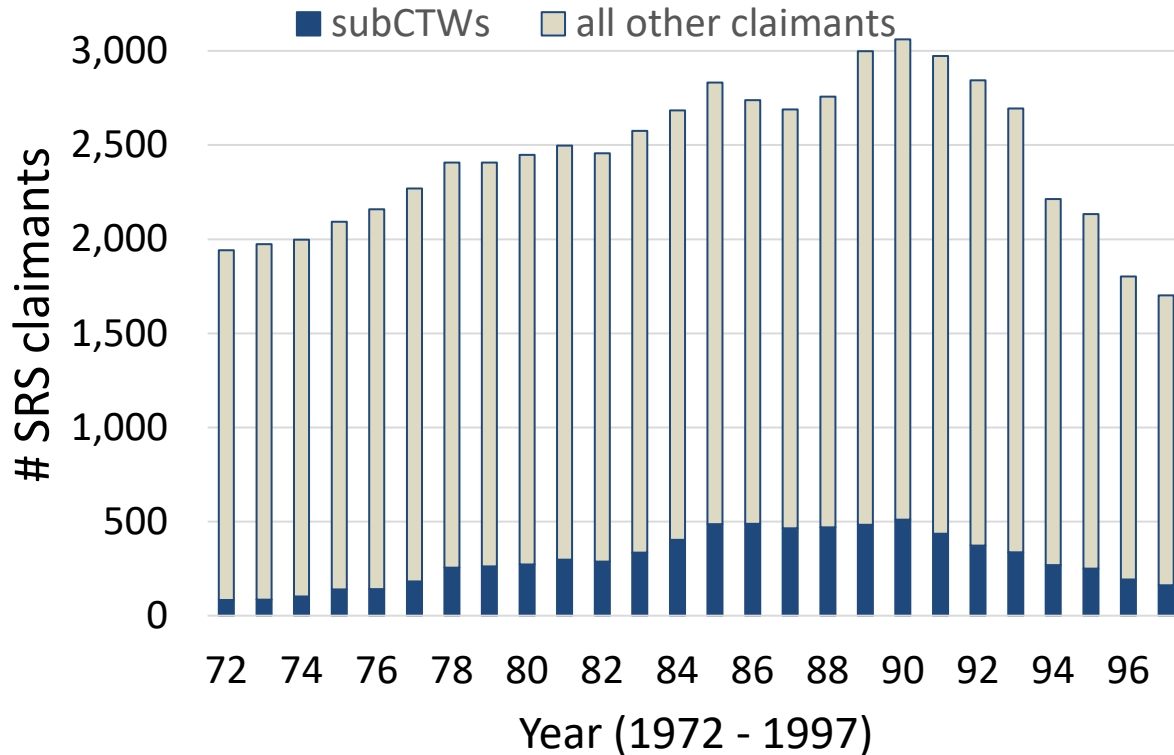


Results

ORAUT-RPRT-0094

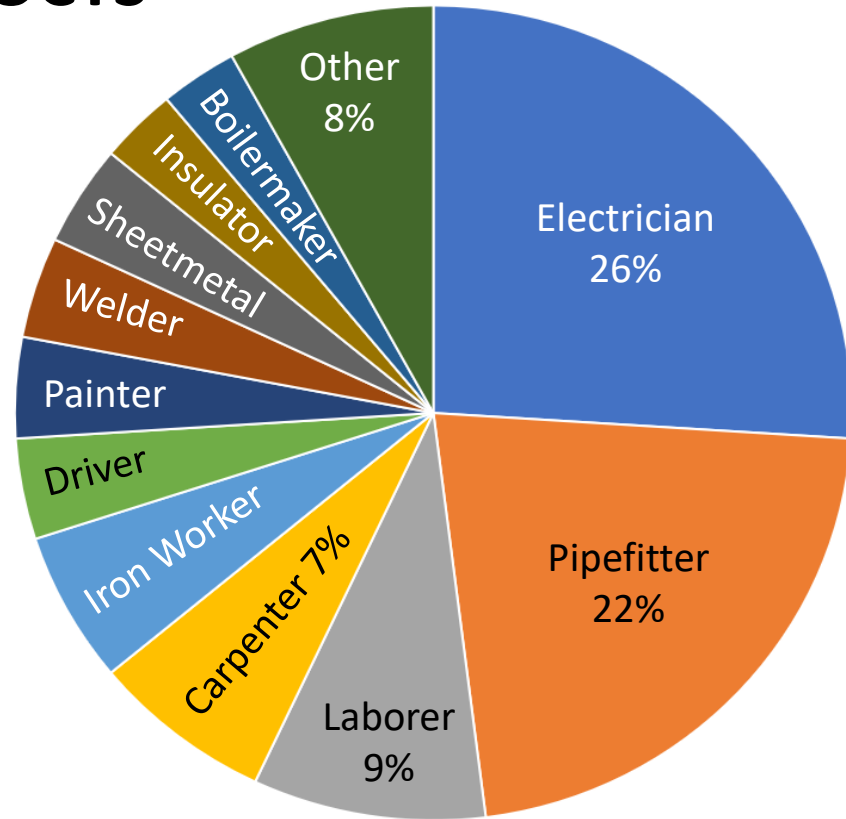
Number of SRS Claimants in NOCTS as of August 2018

(adapted from Figure 5-1)



Subcontractor monitoring in NOCTS

- Only NOCTS data (Claimant Data)
 - 6097 Total SRS Claimants
 - 886 (15%) Subcontractor CTWs
 - Most, if not all, subCTW job titles are represented
- NIOSH Evaluation
 - External Monitoring
 - Internal Monitoring
 - Tritium bioassay
 - non-tritium bioassay (actinides)
 - Whole Body Counting (fission products)



Focus of the NOCTS data evaluation

- Focus on externally monitored subcontractor construction trades workers (subCTWs)
 - New Construction vs. Renovation/Remodeling/D&D
 - Not all externally monitored work required internal monitoring
- Benefits of analysis:
 - Covers all areas
 - Represents data used in Dose Reconstruction
 - Simplistic internal analysis

Why the simplistic internal monitoring approach?

- Radionuclide specific internal monitoring depends on where the worker conducted their work (*SRS is a Very Large Site*)
 - Subcontractors in reactor areas likely didn't need plutonium monitoring, but may have needed tritium or fission products
 - Subcontractors in plutonium areas likely didn't need tritium monitoring
 - Subcontractors in tritium areas likely didn't need plutonium or fission product monitoring
- ***Fundamental question: Are subcontractors sufficiently represented or bounded in the co-exposure models?***

Example Attachment B of ORAUT-RPRT-0094

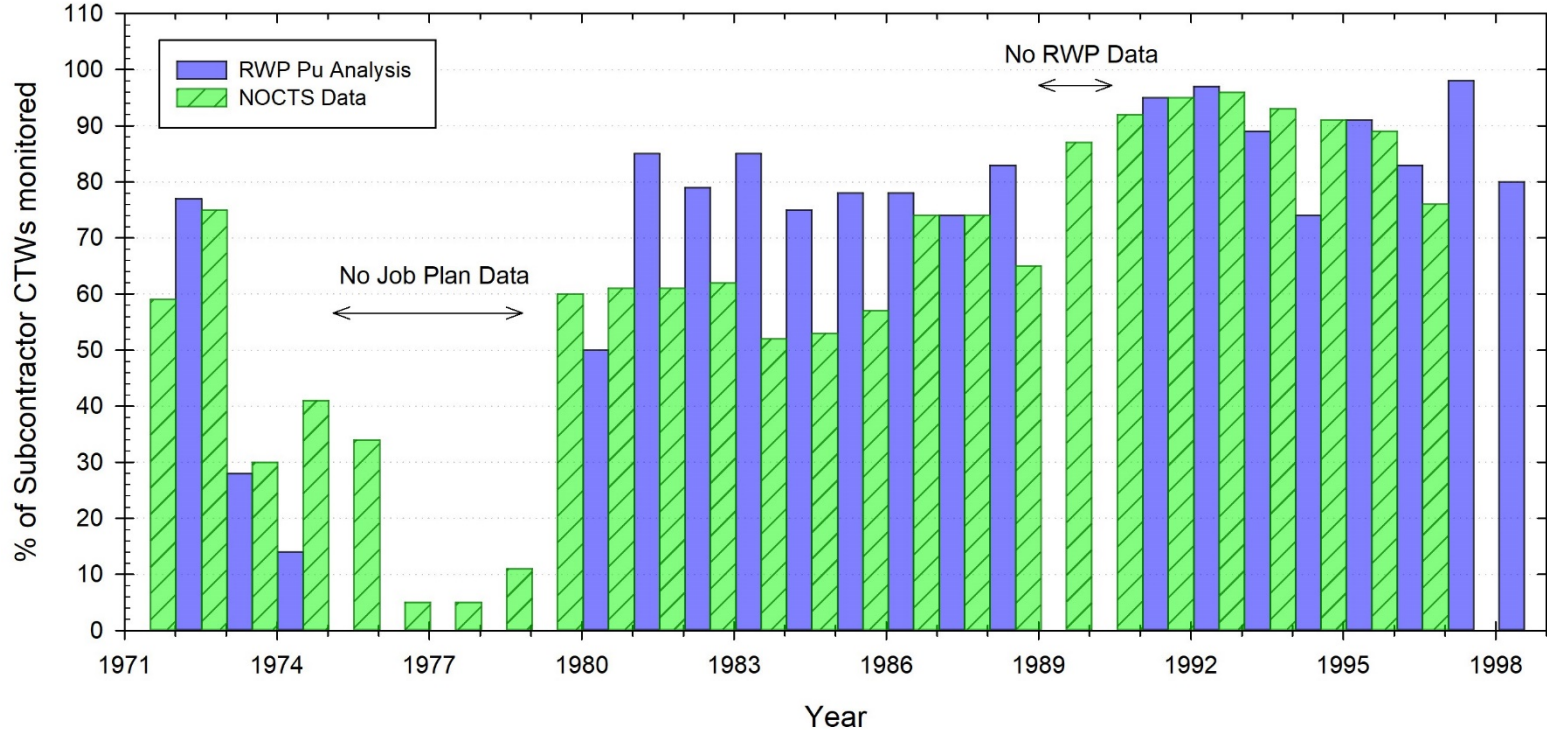
subcontractor CTWs who started in 1980 (page 47)

Craft	Internal Monitoring Evaluation	80	81	82	83	84	85	86	87	88	89	90	91	92
Electrician	Yes – Internal in Last Year of External Monitoring ¹	N ¹	ET ¹	N ¹	nd	nei	nd	nd	nd	EW ¹	nd	nd	nd	nd
Electrician	N/A – Employment after 1997	EN ¹	EN ¹	EN ¹	EN ¹	E ²	E ²	N ¹	EN ¹	ET ¹	EW ₁ T ₁	EW ₁ T ₁	EW ₁ T ₁	EW ₁ T ₁
Electrician	No – External after Last Internal Monitoring ²	N ¹	EN ¹	E ²	N ¹	E ²	nd	nd	nd	nd	nd	nd	nd	Nd
Insulator	Yes – Internal in Last Year of External Monitoring ¹	E ¹	ENT ¹	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Laborer	Yes – Internal in Last Year of External Monitoring ¹	EN ¹	N ¹	N ¹	EN ¹	EN ¹	EN ¹	E ²	EN ¹	E ²	EW ₁ T ₁	EW ₁ T ₁	EN _{WT} ¹	EN _{WT} ¹

1 = bioassay data; **2** = no bioassay data; E = External monitoring, N = Non-tritium urine bioassay, T = Tritium urine bioassay, W = Whole Body Count, nd = not employed: no data, nei = employed: but no external or internal monitoring

Comparison RWP Analysis and NOCTS Claimant Data

(NOCT Data adapted from Table 5-4)



Conclusion

ORAUT-RPRT-0094

RPRT-0094 Summary (NOCTS data)

- 1990-1998 – High percentage of subcontractor (>75%) CTWs in NOCTS were monitored and would be sufficiently represented in a co-exposure model
- 1980-1989 – Moderate percentage (>50%) of subcontractor CTWs in NOCTS were monitored and would be sufficiently represented in a co-exposure model
- 1972-1979 – Initially a moderate percentage of subcontractor CTWs were monitored for internal exposures, however, there is a marked decrease into the late 1970s followed by a surge of monitoring starting in 1980
 - ***Similar pattern as observed in the “limited” RWP evaluation***

Conclusion

The overall trend observed in these data is that the subcontractor construction trade workers who were monitored were represented as least as well as other SRS workers. The completeness of the data is more than adequate for dose reconstruction and for the basis of the SRS coexposure model.

Questions?

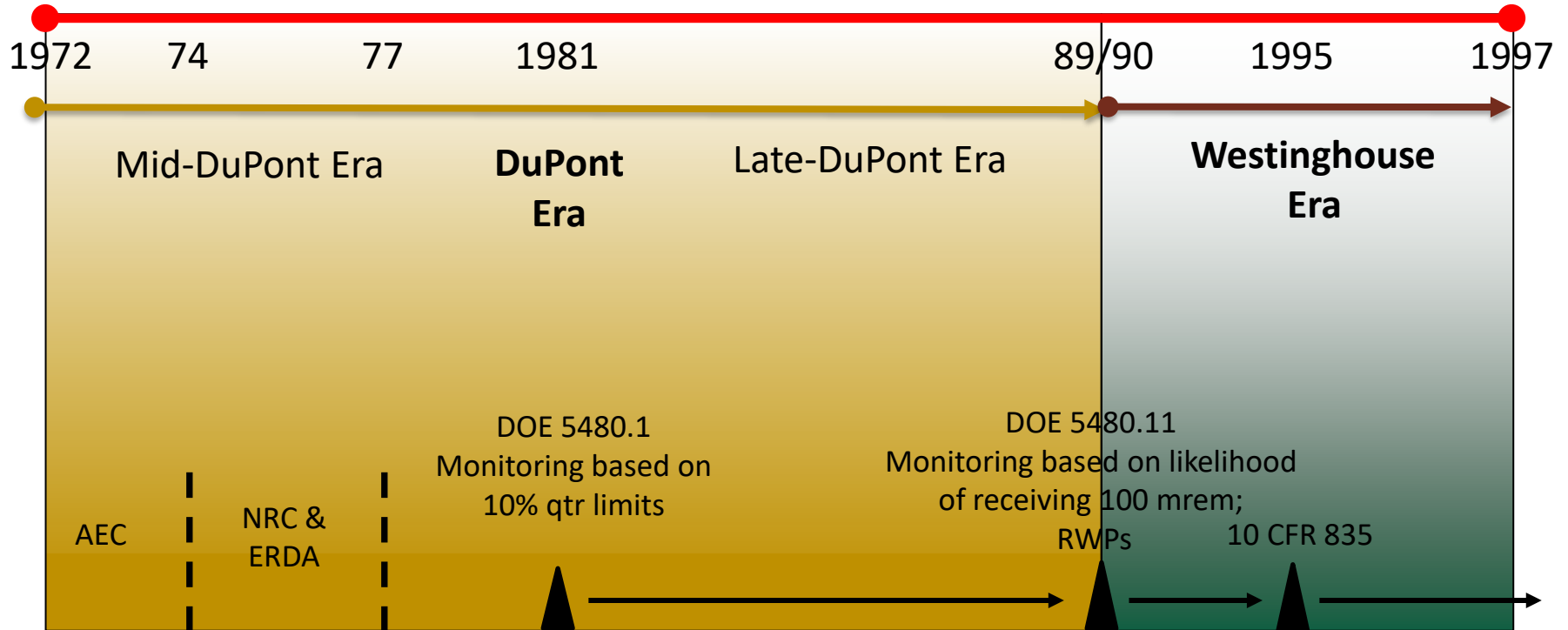
For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

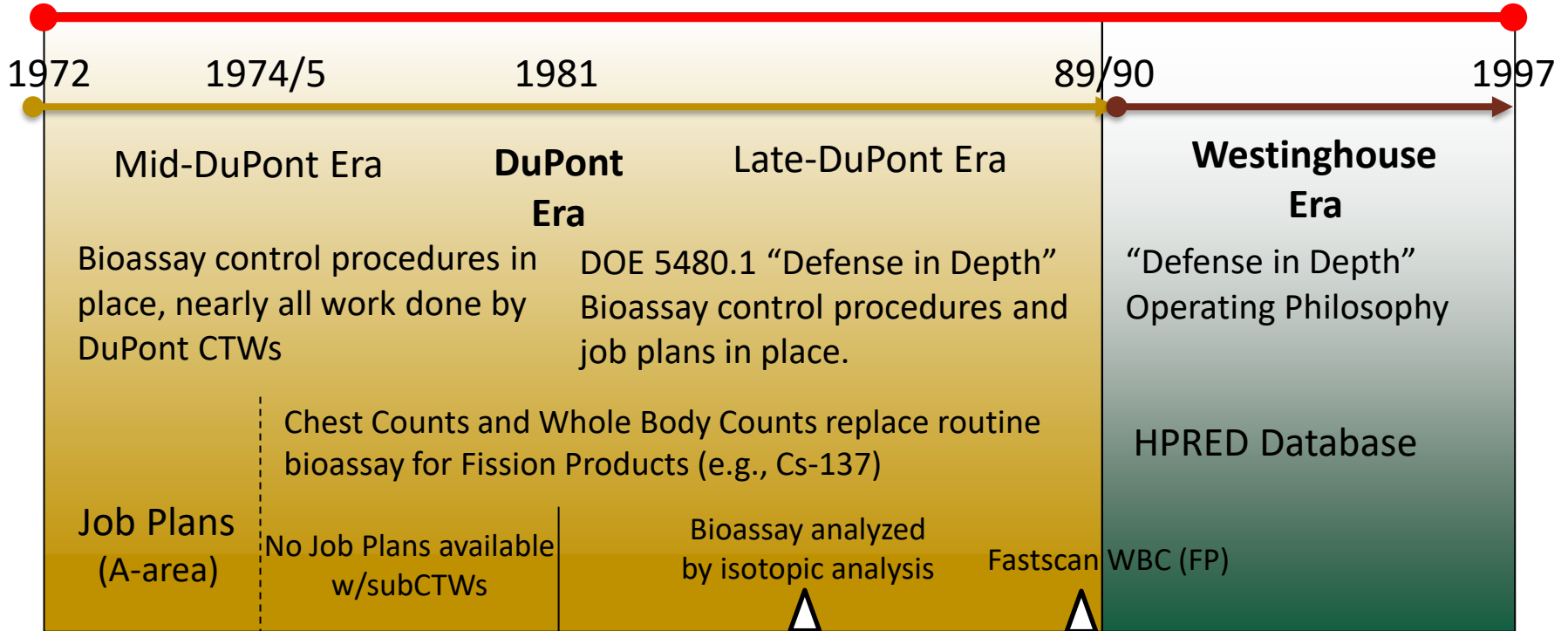
Extra Slides

ORAUT-RPRT-0094

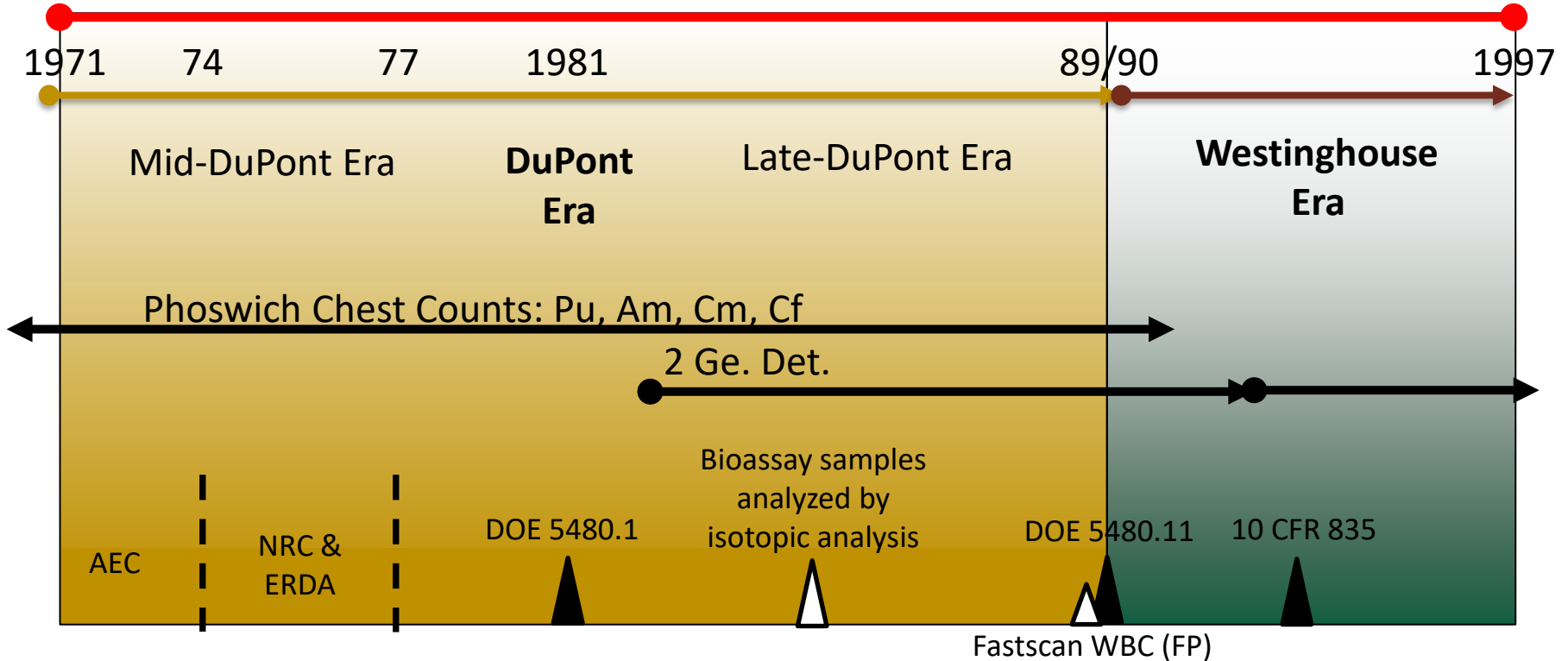
RPRT-0094 timeline (regulatory changes)



RPRT-0094 timeline (radiological control measures)

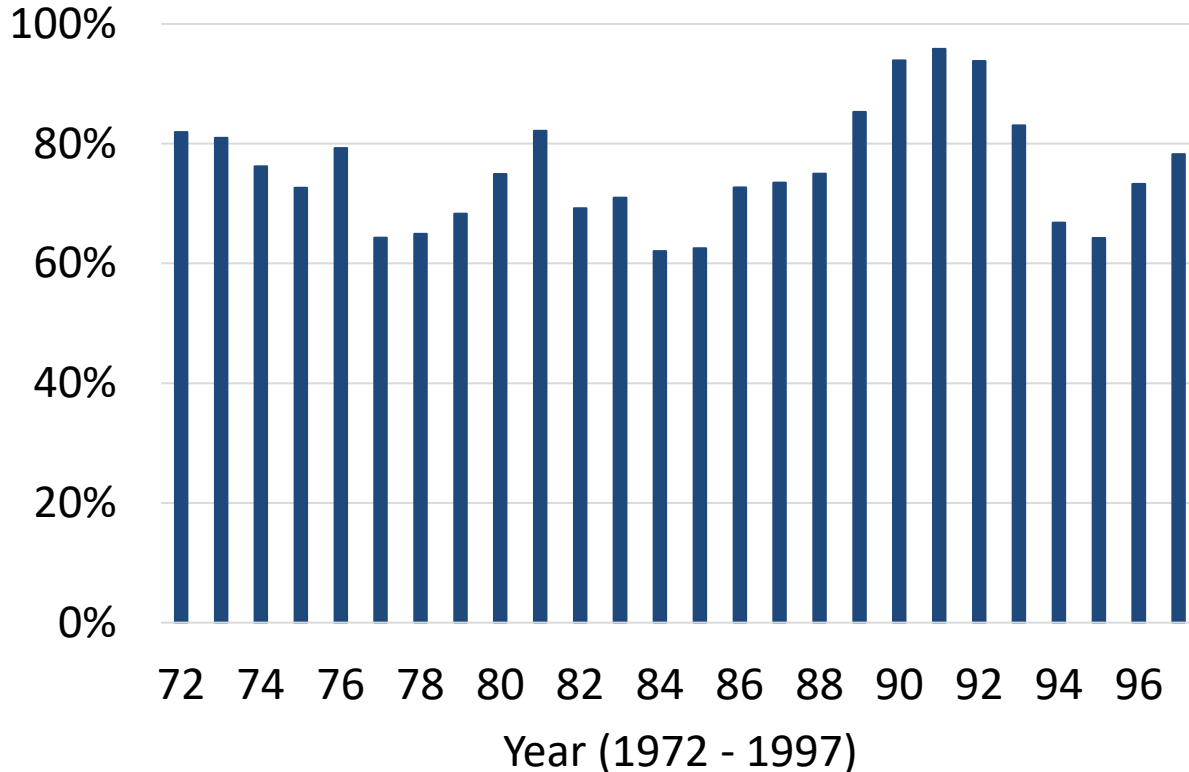


RPRT-0094 timeline (Chest Count Capabilities)

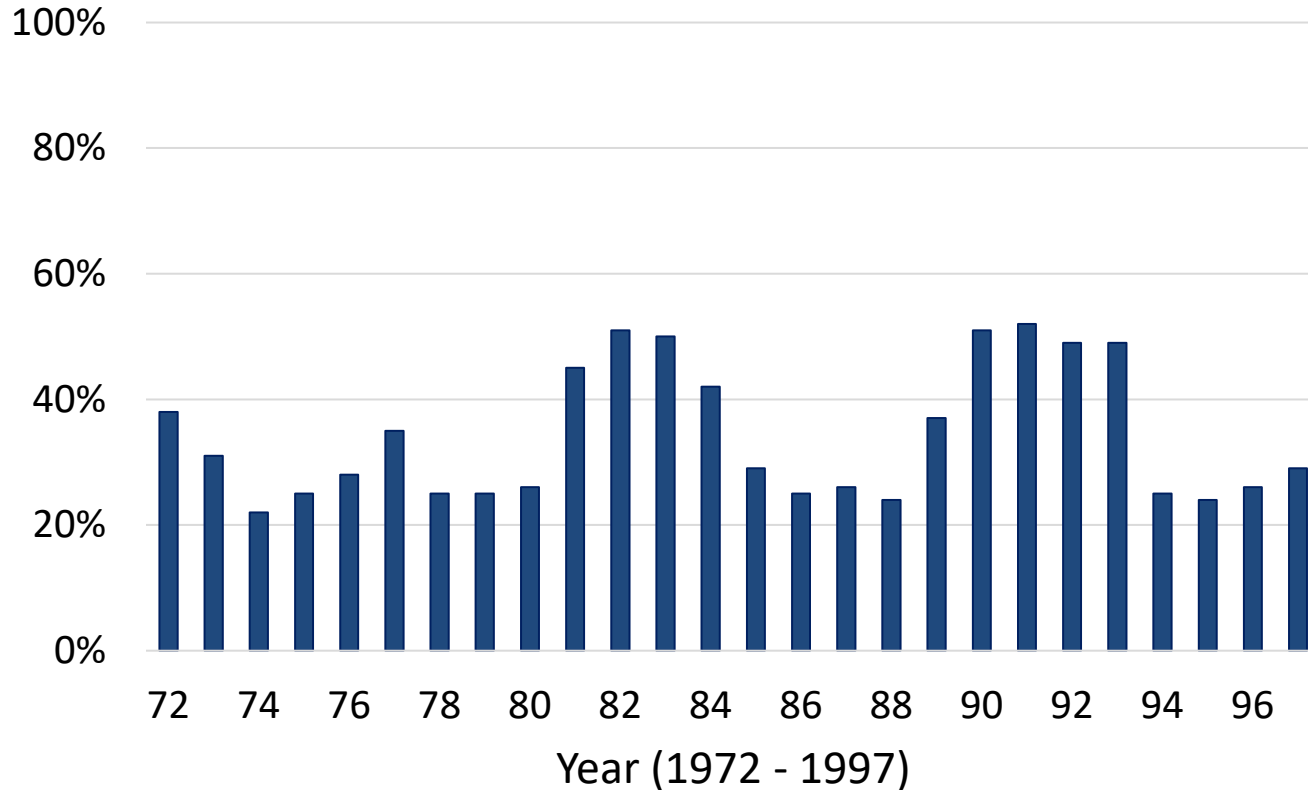


Percent subCTWs with External Monitoring Data

(adapted from Figure 5-2)



Percent subCTWs with dosimetry data and monitored for tritium exposures (adapted from Table 5-3)



Percent subCTWs with external and internal monitoring data (adapted from Figure 5-3)

