Dose Reconstruction Process Overview

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Division of Compensation Analysis and Support

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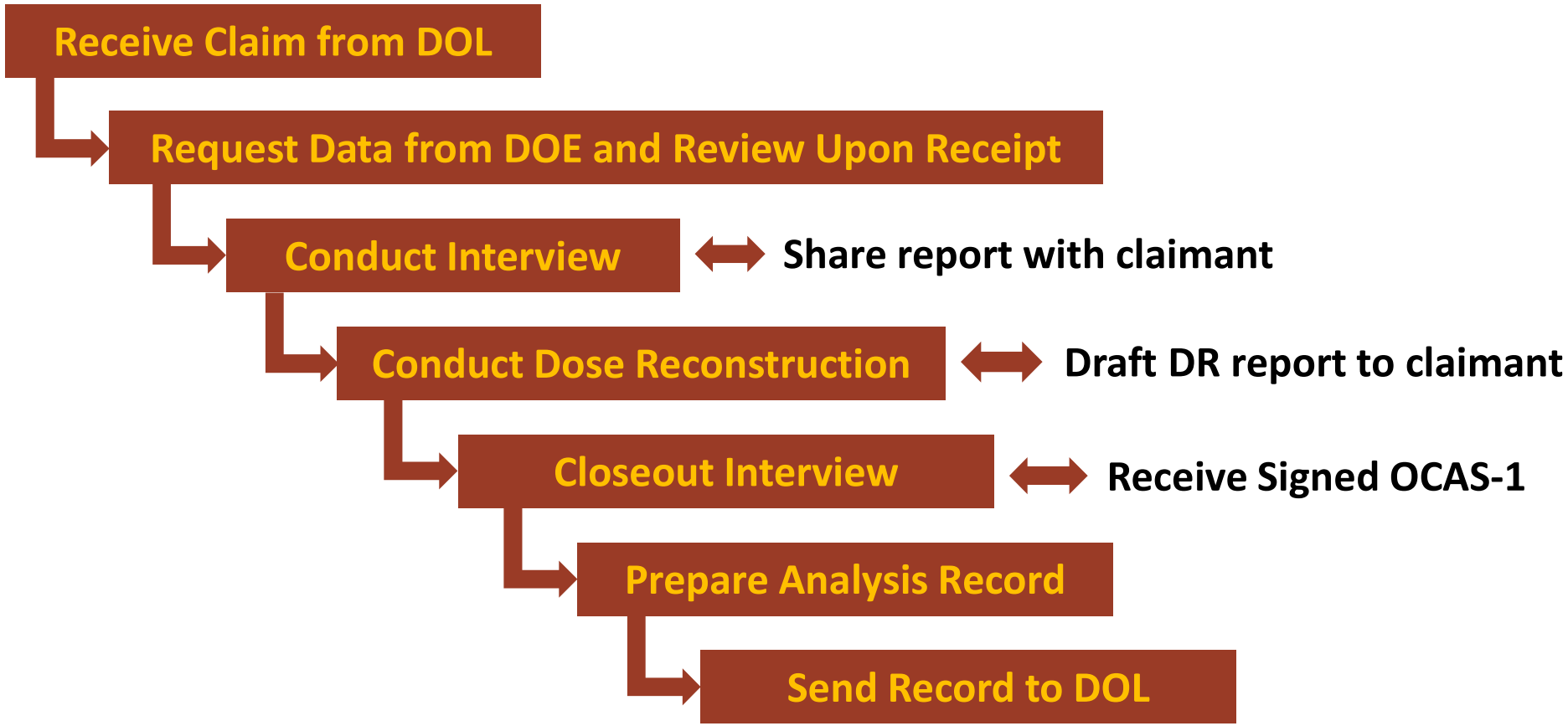
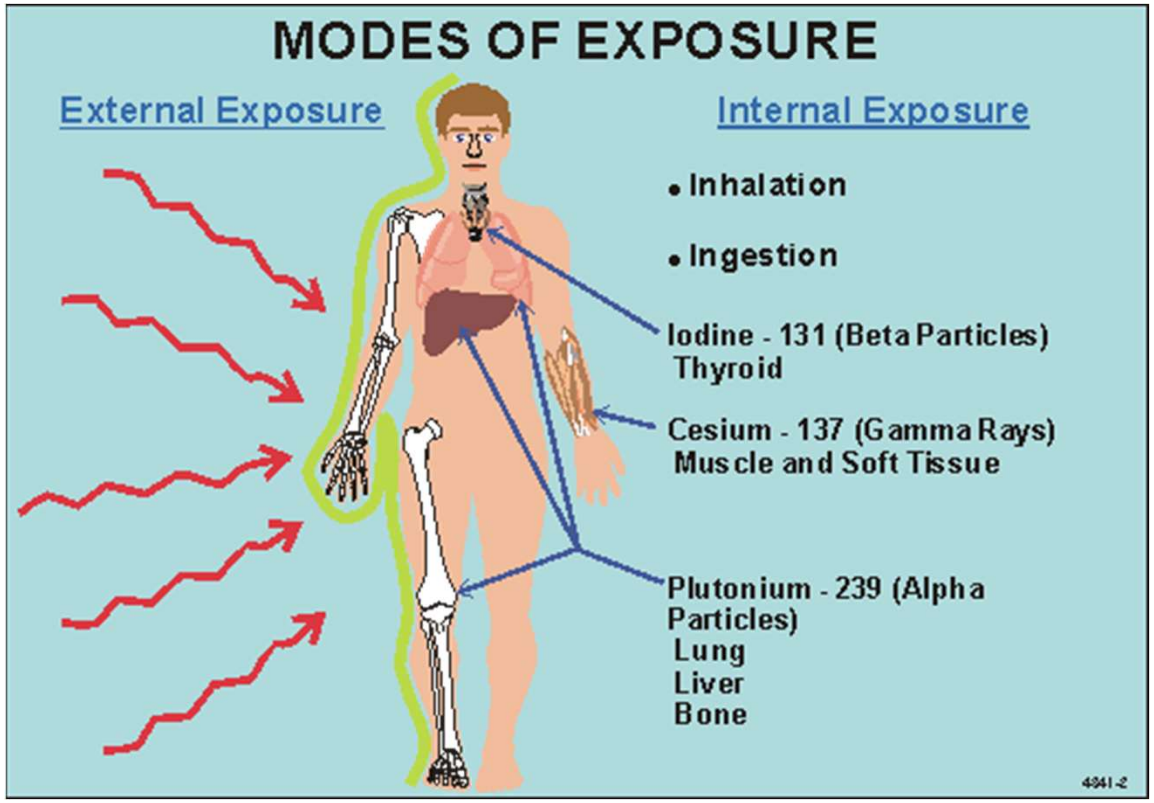
Richland, Washington

Dose Reconstruction Process



Frequently Used Terms

- **External Dose: Dose received from radiation originating outside the body.**
- **Internal Dose: Dose received from radiation originating inside the body.**



Frequently Used Terms - continued

- **Overestimate**
- **Best Estimate**
- **Underestimate**
- **Partial Estimate**

Factors impacting Dose Reconstructions

- **Time**
- **Claimant favorability**
- **Reasonable**
- **Special Exposure Cohort**

Basics of Dose Reconstruction

- Use all available worker and workplace information to reconstruct dose
- Evaluate all doses of record for data quality shortcomings
- Evaluate potential for undetected dose
- Use recommendations established by national and international organizations

Basics of Dose Reconstruction - continued

- **Prefer to use individual monitoring data if available and of sufficient quality**
- **Use standard methods to evaluate "missed dose"**
- **Rely on use of area dosimeters, radiation surveys, and air sampling if individual data is not available**
- **If no monitoring data, then use available data on source term, etc.**

Basics of Dose Reconstruction - continued

When individual dose monitoring results are not available doses can be estimated using:

- **Co-exposure Models**
- **Surrogate Data**
- **Source-term modeling**

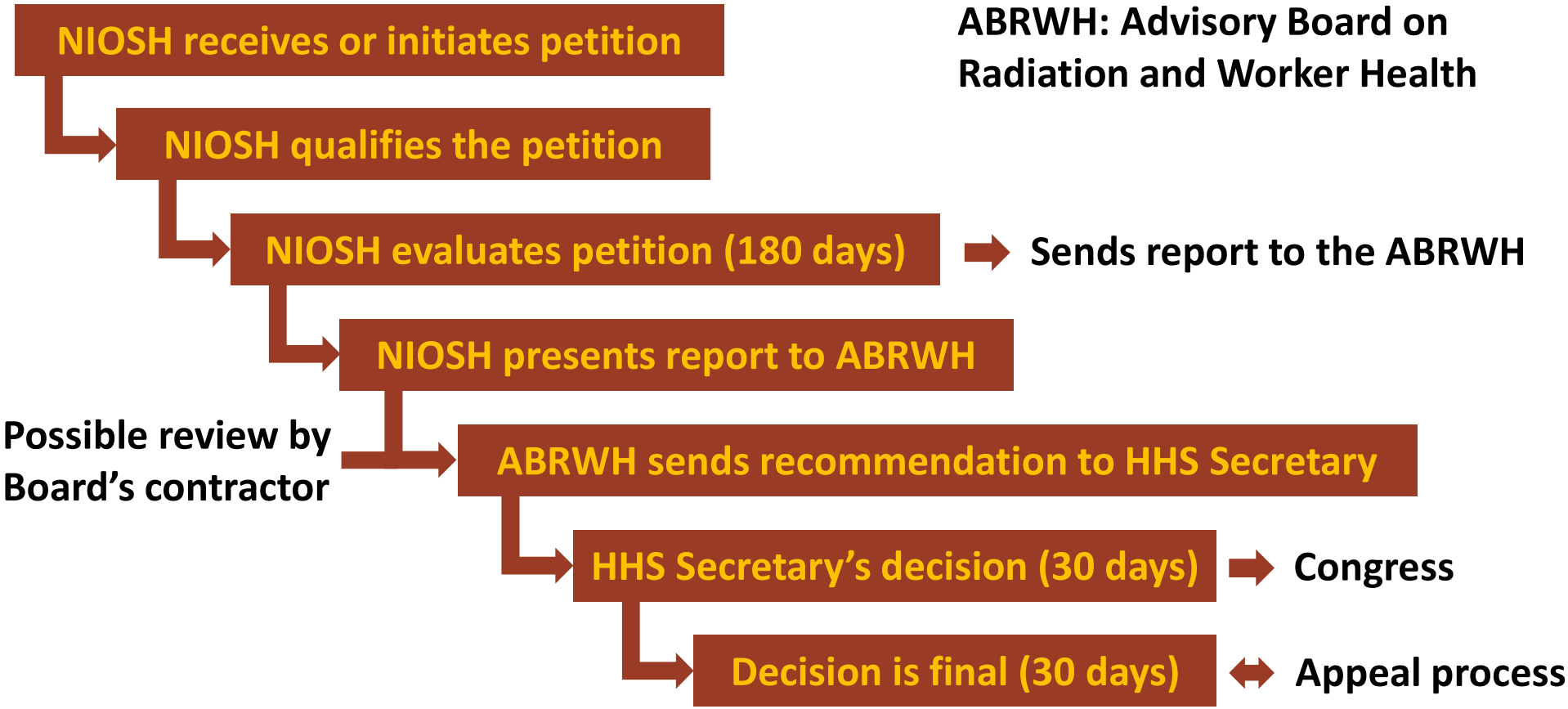
Claimant Favorable Approach

When a choice must be made between different approaches and there is no information about which approach is most technically accurate, NIOSH chooses the approach resulting in the highest probability of causation.

Some examples include:

- Conservative Dose Conversion Factors
- Addition of potential missed dose
- Solubility class of radionuclide for internal dosimetry
- Aged Pu with Am buildup
- Upper 99th percentile of credibility limit to determine Probability of Causation.

Special Exposure Cohort Petitioning Process



ABRWH: Advisory Board on Radiation and Worker Health

Advice, Assistance and Questions

The NIOSH SEC Petition Counselor and the NIOSH EEOICPA Ombudsman provide advice and assistance to petitioners and prospective petitioners.

SEC Petition Counselor
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EXTRA SLIDES for Q&A

Special Exposure Cohort Overview

Special Exposure Cohort Overview

Charles Nelson, MS
Special Exposure Cohort Team Lead
Division of Compensation Analysis and Support

NIOSH Workshop on Dose Reconstruction and Special Exposure Cohort
Hanford Site

Pasco, Washington
March 29, 2023

Overview (1 of 3)

- Federal Regulation (42 CFR 83)
  - Describes how Department of Health and Human Services (HHS) will consider designating classes of employees to be added to the Special Exposure Cohort (SEC) under EEOICPA

Overview (2 of 3)

- Statutory SECs
  - Gaseous Diffusion Plants – Paducah, Portsmouth, and K-25
  - Amchitka Island

Overview (3 of 3)

- An SEC is a designation given to a class of employees for whom sufficiently accurate dose reconstructions are not possible
  - Claims compensated under the SEC do not have to go through the dose reconstruction process
- Eligible members of the class include individuals who
  - Meet the class definition
  - Typically require 250 aggregate days at an SEC facility
  - Have one of the 22 specified cancers

22 Types of Specified Cancers Covered by the SEC

Anytime
Bone cancer
Kidney cancer
Lung cancer (other than in-situ cancer that is discovered during or after a post-mortem exam)

Onset 2 Years after First Exposure
Leukemia (other than chronic lymphocytic leukemia)

Onset 5 Years after First Exposure	
Multiple myeloma	
Lymphomas (other than Hodgkin's disease)	
Primary cancer of the:	
• Bile ducts • Brain • Breast (female) • Breast (male) • Colon • Esophagus • Gall bladder • Liver (except if cirrhosis or hepatitis B is indicated)	• Ovary • Pancreas • Pharynx • Salivary gland • Small intestine • Stomach • Thyroid • Urinary bladder

Claims that are not one of the 22 Specified SEC Cancers

- Radiation dose reconstruction can still be performed for these claim; however,
- If the SEC class was granted based on NIOSH's inability to reconstruct part of your dose, you will only get a partial dose reconstruction

SEC Petitioning Process

- There are seven main steps that a petition will go through before it can be added as a new SEC class:
  - Petition submission
  - Qualification
  - Evaluation
  - Evaluation Report presented to the Advisory Board on Radiation and Worker Health (Advisory Board)
  - Advisory Board recommendation
  - Secretary of HHS designation
  - Submission to Congress

Petition Submission Forms

- Forms are optional and provide guidance as to what type of information will be used by NIOSH to qualify a petition
  - Form A should be used if NIOSH has notified the claimant/petitioner that a dose reconstruction cannot be completed under 83.14
  - Form B should be used if petitioner(s) believes a class should be added and are requesting NIOSH evaluate a class for addition to the SEC under 83.13

Who can petition?

- An employee or former employee included in the proposed class, or survivor(s) of a deceased employee
- A union representing employees in the proposed class
- A person authorized by one or more employees in the proposed class, or their survivors

Petition Submission

- Information on filing and forms can be found:
  - On our Web site at https:www.cdc.gov/niosh/ocas/how2add.html
  - By phone at 1-877-222-7570

Qualification Process (1 of 7)

- Once a petition is submitted it is reviewed by NIOSH to determine whether it meets the minimum requirements established in the SEC rule

Qualification Process (2 of 7)

- In order to qualify for evaluation, the petition must include:
  - Identifying and contact information for the petitioner(s)
  - A proposed class definition
    - Specifying a single DOE or AWE facility
    - Location(s) at the facility that are included
    - Job titles and/or job duties of the class members
    - Period of employment relevant to the petition

Qualification Process (3 of 7)

- A description of the basis for believing records and information available are inadequate to estimate radiation doses, based on one of the following:
  - Lack of radiological monitoring
  - Destruction, falsification, or loss of records
  - Expert report
  - Scientific or technical report

Qualification Process (4 of 7)

- NIOSH works closely with petitioners during the qualification process to explain any deficiencies in the petition and to aid the petitioner in submitting any needed materials

Qualification Process (5 of 7)

- Reasons a petition would not qualify for evaluation:
  - Petitioner is seeking a second opportunity to qualify a claim for compensation following a dose reconstruction and final decision by DOL
  - Covers an already existing SEC class
  - Does not provide a basis for the inclusion of a class into the SEC
  - Covers multiple facilities
  - Is voluntarily withdrawn by the petitioner

Qualification Process (6 of 7)

- If a petition does not qualify, it is administratively closed
  - Petitions can be reopened at any time if new information becomes available
  - Petitioner(s) can request an administrative review, to be performed by NIOSH, of a decision that a petition does not qualify
    - Appeal must be sought within 30 days of the petition not qualifying

Qualification Process (7 of 7)

- If a petition qualifies for evaluation, NIOSH reviews the petition as submitted and evaluates it according to the SEC Rule
- Appropriate notices are sent to:
  - Petitioner(s)
  - The Advisory Board on Radiation and Worker Health
  - Congressional Staff
- Notices are also:
  - Published as a notice in the Federal Register
  - Posted on the NIOSH Web site

Evaluation Process (1 of 2)

- NIOSH will evaluate records and information collected to determine:
  - Is it feasible to estimate the radiation doses of individual members of the class with sufficient accuracy?

Evaluation Process (2 of 2)

- Sufficient accuracy means:
  - NIOSH has sufficient information to estimate the maximum radiation dose for every type of cancer for which radiation doses are reconstructed, that could have been incurred in the plausible circumstances by any member of the class, or
  - NIOSH has sufficient information to estimate the radiation doses of members of the class more precisely than an estimate of the maximum radiation dose

Evaluation Presentation

- Once NIOSH completes the Petition Evaluation Report, the report and findings are presented to the Advisory Board
- The Advisory Board meeting dates and locations where the discussion of the petition will be held are provided to the petitioner(s), published as a notice in the Federal Register, and posted on the NIOSH Web site
- Petitioners are invited to participate in the Advisory Board's discussion of the petition if they so choose

Advisory Board Recommendation

- The Advisory Board will review and consider the NIOSH Petition Evaluation Report, public comments, and any additional relevant information when formulating their recommendation
- The Advisory Board will submit their recommendation to the Secretary of HHS to either add or deny adding the class to the SEC

Secretary of HHS Designation

- The Director of NIOSH reviews the Petition Evaluation Report, public comments, and the Advisory Board recommendation to develop a proposed decision to the Secretary of HHS
- The Secretary of HHS uses the recommendations provided by the Director of NIOSH and the Advisory Board to make a decision on whether to add or deny adding the class to the SEC
- The Secretary makes the final decision on whether to add the class to the SEC and will submit a report of the final decision to Congress when recommending a class

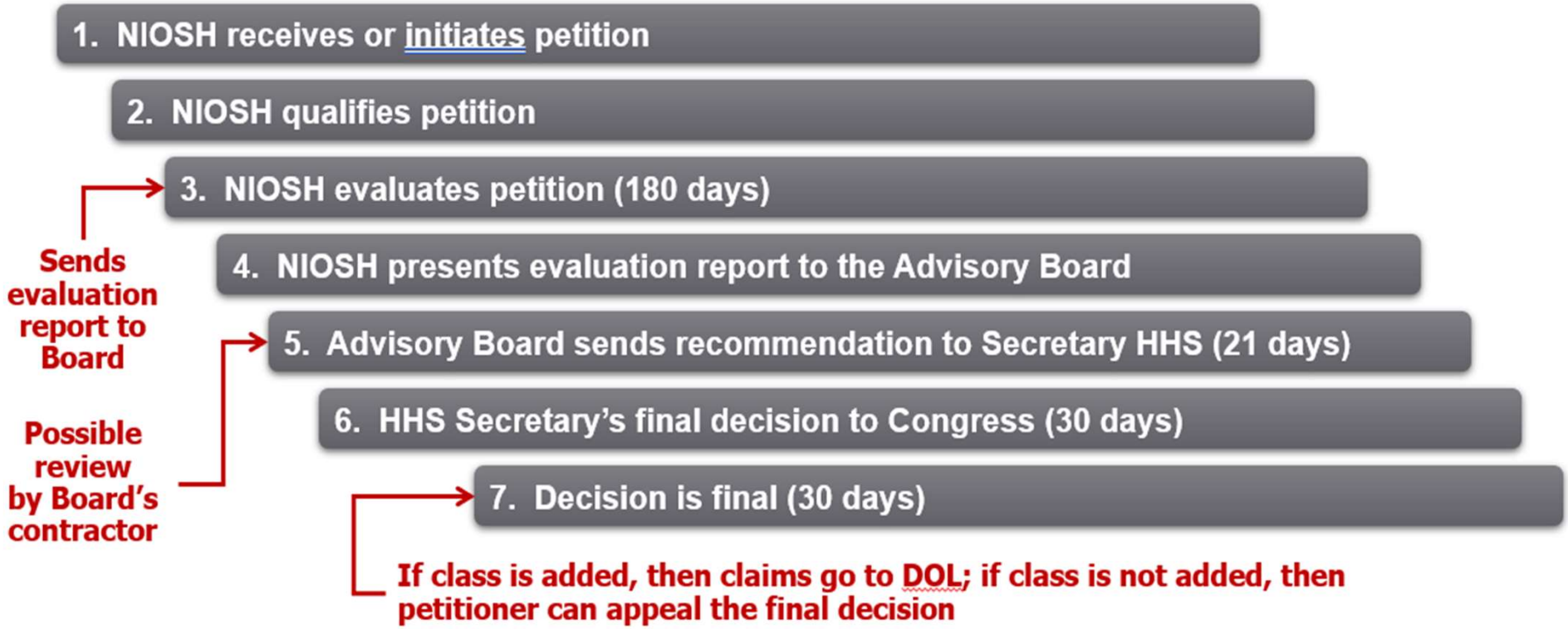
Submission to Congress (1 of 2)

- Once the Secretary of HHS submits a report of the final decision to Congress, Congress can either reverse or expedite that decision
- If Congress does not act within 30 days, the Secretary's decision becomes final

Submission to Congress (2 of 2)

- Once the decision is final, the Secretary of HHS will issue a report providing a decision. If the class is added, then the report will provide the class definition and announce the addition of the class to the SEC
  - The Secretary's decision is provided to DOL, provided to the petitioners, and posted on the NIOSH Web site

SEC Petitioning Process (review)



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Ombudsman to NIOSH
Denise Brock

Questions?

Hanford SEC Statuses

Existing Hanford SECs (SEC-0057,00152,00201,00226)

- NIOSH found it was not possible to reconstruct doses:
  - Inadequately monitored radionuclides such as plutonium, thorium, and neptunium from Oct. 1, 1943 through Jun. 30, 1972 (SEC- 0057, SEC-0152)
  - DR not feasible for highly enriched uranium, U-233, thorium, or neptunium from Jul, 1, 1972 through Dec. 31, 1983 (SEC-0201)
- NIOSH found dose reconstruction is not feasible for employees of DOE contractors and subcontractors except those of employers excluded during the period of January 1984 through December 31st 1990 due to inadequate bioassay monitoring (SEC-0226)
  - See Class Definition

SEC-00226 (Jan. 1, 1984 – Dec 31, 1990)

- March 2015 83.14 petition evaluation (SEC-00226)
- Class Definition for SEC-00226
  - Contractors and subcontractors (excluding employees of the following Hanford prime contractors during the specified time periods: Battelle Memorial Institute, January 1, 1984 through December 31, 1990; Rockwell Hanford Operations, January 1, 1984 through June 28, 1987; Boeing Computer Services Richland, January 1, 1984 through June 28, 1987; UNC Nuclear Industries, January 1, 1984 through June 28, 1987; Westinghouse Hanford Company, January 1, 1984 through December 31, 1990; and Hanford Environmental Health Foundation, January 1, 1984 through December 31, 1990) who worked at the Hanford site in Richland, Washington, during the period from January 1, 1984 through December 31, 1990

DR Feasibility

Table 7-1: Summary of Feasibility Findings for SEC-00226 January 1, 1984 through December 31, 1990			
Source of Exposure	**Reconstruction Feasible (January 1, 1984 through June 28, 1987)**	**Reconstruction Feasible (June 29, 1987 through December 31, 1990)**	**Reconstruction Not Feasible (January 1, 1984 through December 31, 1990)**
Internal	**Employees of:** **- Department of Energy** **- Battelle Memorial Institute** **- Westinghouse Hanford Company** **- Hanford Environmental Health Foundation** **- Rockwell Hanford Operations** **- Boeing Computer Services Richland** **- UNC Nuclear Industries**	**Employees of:** **- Department of Energy** **- Battelle Memorial Institute** **- Westinghouse Hanford Company** **- Hanford Environmental Health Foundation**	**ALL OTHER employees of the Department of Energy contractors and subcontractors**

IT Modernization

IT Modernization: Discovery

- NIOSH discovered potential security vulnerabilities in DCAS systems in May of 2021
- Existing systems for processing dose reconstructions and SEC petitions were shut down
- This was done without warning to not bring attention to any vulnerabilities
- There were no known breaches of data of any kind

IT Modernization: Path Forward

- A short-term solution is mostly in place and provides manual methods for completing dose reconstructions and Special Exposure Cohort (SEC) petition evaluations.
- Cases that built up when the pause started in May of 2021 have been mostly processed.
- We will continue to add improvements to the short-term solutions to increase production and maintain quality control.
- A long-term solution is in development and will provide a fully automated processes for completing dose reconstructions and Special Exposure Cohort (SEC) petition evaluations

Petition and claims information

The Act → 42 CFR 83

Subpart A: Introduction

Subpart B: Definitions and specific cancer list

Subpart C: Procedures for adding SEC Classes

83.6 – Overview

83.7 – Who can submit a petition?

83.8 – How is a petition submitted?

83.9 – What information must a petition include?

83.10 – If it includes everything in 83.9, will it become an SEC?

The Act → 42 CFR 83

83.11 – What happens to petitions that don't satisfy all requirements in 83.7 to 83.9?

83.12 – How will NIOSH notify stakeholders of petitions that will be evaluated?

83.13 – How will NIOSH evaluate petitions?

83.14 – How will NIOSH evaluate a claimant petition whose dose reconstruction could not be completed under 42 CFR 82?

The Act → 42 CFR 83

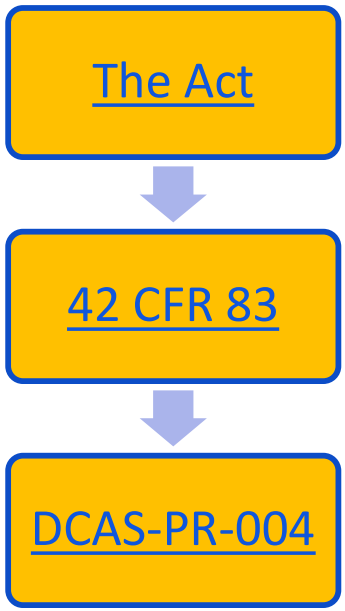
83.15 – How with the ABRWH consider and advise the HHS Secretary on a petition?

83.16 – How will the HHS Secretary decide the outcome?

83.17 – How will the HHS Secretary report a final decision?

83.18 – How can petitioners obtain an administrative review of a final decision?

83.19 – How can the HHS Secretary cancel or modify a final decision?



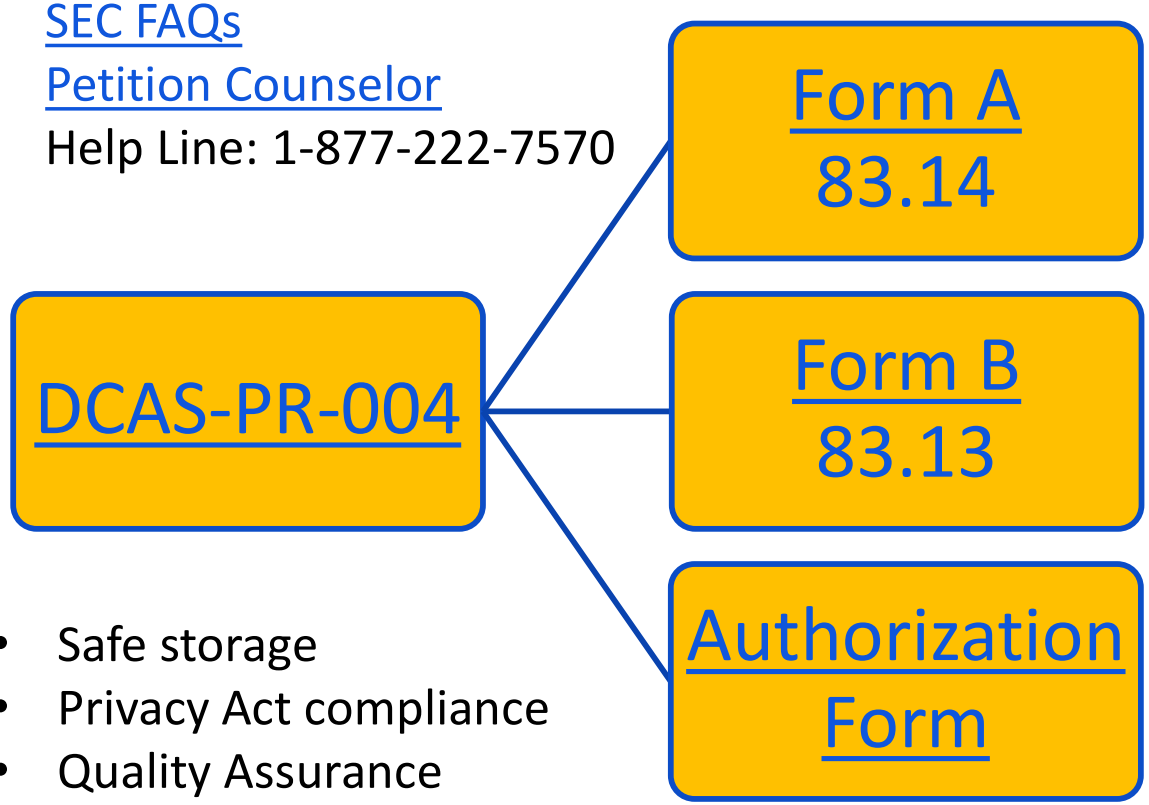
Energy Employees Occupational Illness Compensation Program Act (EEOICPA) of 2000

Procedures for Designating Classes of Employees as Members of the Special Exposure Cohort Under the EEOICPA of 2000

Internal Procedures for the Processing of Special Exposure Cohort Petitions

Submitting an SEC Petition

- SEC FAQs
- Petition Counselor
- Help Line: 1-877-222-7570



Use only if NIOSH has reported to you in writing that it cannot complete the dose reconstruction

NIOSH has ***not*** reported to you that it cannot complete the dose reconstruction [Goto 83.13 process]

Representing an employee or a survivor of an employee requires written authorization

- Safe storage
- Privacy Act compliance
- Quality Assurance

DCAS-PR-004; Form B, 83.13 – Processing SEC Petitions

Petition

- **180 days** to qualify or not qualify
- 42 CFR 84 §7384q (c)

DCAS 6.1.1

- Receives Petition
- Acknowledge receipt to petitioner
- Assign DCAS HP
- DCAS/ORAU pend claims if necessary

DCAS-PR-004; Form B, 83.13 – Processing SEC Petitions

DCAS 6.1.2

- Establish qualification of petitioner
- DCAS/ORAUT Consult Call

DCAS 6.1.3

- Confirm scope of the proposed class
  - Limited to single facility
  - Time frame, occupations, etc.

DCAS-PR-004; Form B, 83.13 – Processing SEC Petitions

DCAS 6.1.4

- Other concurrent petitions?
- Combine as necessary

DCAS 6.1.5

- Review petitioner(s) basis
  - Inadequate records or information?

DCAS-PR-004; Form B, 83.13 – Processing SEC Petitions

DCAS 6.1.6

- **30 days** from receipt of petition
- **DRAFT** Petition Qualification Report
  - Not qualified: 30 days to revise
  - Qualified: create team and plan

DCAS 6.1.7

- **75 days** from receipt of petition
- **FINAL** Petition Qualification Report

There are provisions to extend the 180 days deadline in DCAS-PR-004 with proper justification.

Claimant Favorability

Claimant Favorable Approach – continued

External Dose

- Dose conversion factor selection typically conservative
- External co-worker data calculations are highly claimant favorable due to inclusion of missed dose
- External co-worker data assignment approach is claimant favorable (50th or 95th percentile selection)
- Unmonitored neutron dose using neutron/gamma ratios is based on claimant-favorable assumptions
- Technical Basis Documents (TBDs) often default to worse case exposure assumptions for unmonitored workers

Claimant Favorable Approach – continued

External Ambient Dose

- TBD values are typically based on highest measured data
- Unknown work locations leads to selection of highest TBD values
- Values sometimes include natural background dose
- Ambient dose sometimes double counted if worker was monitored and background subtraction process not known
- 30-250 keV default energy assumption

Claimant Favorable Approach – continued

Occupational X-ray Dose

- Photofluorography (PFG) assumption in some cases when no clear evidence
- Default TBD frequencies are generally claimant favorable
- TBD frequencies assumed if data are not available, even if claimant interview indicated no procedures occurred
- In some cases procedures are counted even if voluntary
- Claimant-favorable assumptions applied for skin cases based on entrance skin exposure

Claimant Favorable Approach – continued

Internal Dose

- Solubility class assumption – can affect dose by orders of magnitude
- Radionuclides that result in highest organ dose are selected when there is uncertainty
- Organ selection for internal dose calculation is often claimant favorable (e.g., lymphomas)
- Missed dose is based on earliest possible intake date
- Dose assignment for unmonitored workers is based on internal co-worker data if any exposure potential

Miscellaneous

Frequently Used Terms - continued

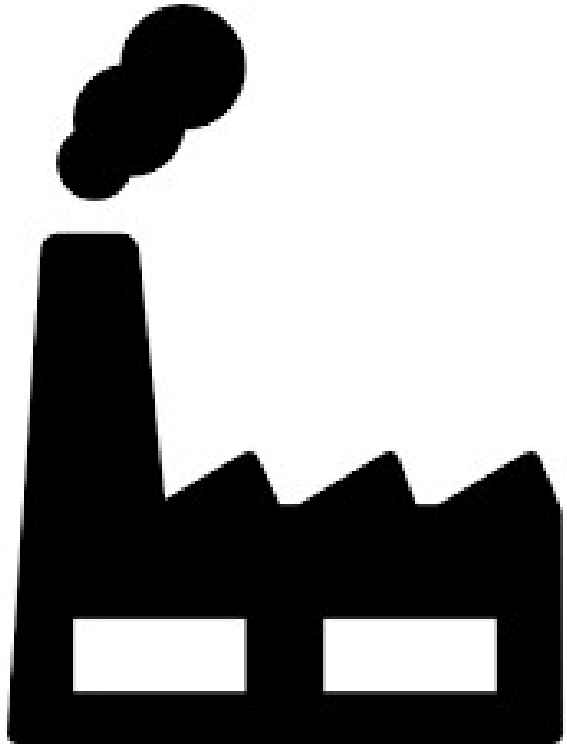
Occupational Medical Dose

- Includes diagnostic X-rays required as a condition of employment.
- Does not include X-rays resulting from illness or injury, diagnostic X-rays performed for diagnosis of illness, or dose resulting from nuclear medicine tests or radiation therapy.

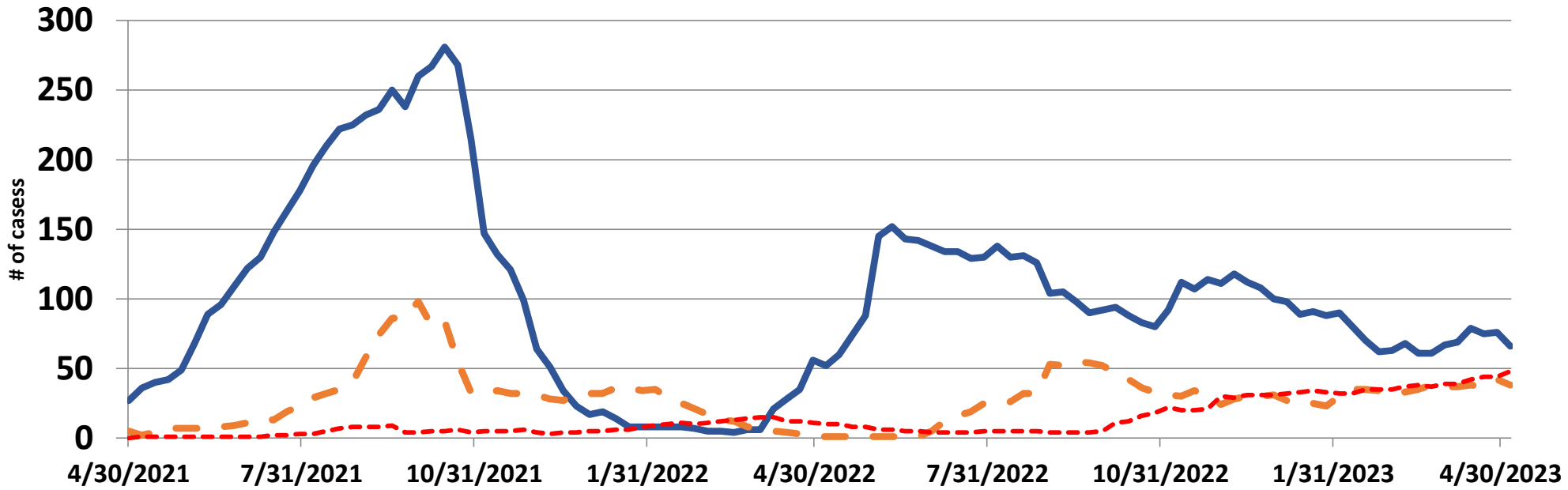
Frequently Used Terms - continued

Environmental Dose

- The dose measured on and around these facilities.
- Includes external radiation as well as airborne radioactivity.
- Most useful in cases where no dosimetry records exist.



Age of Cases Since the Pause Began



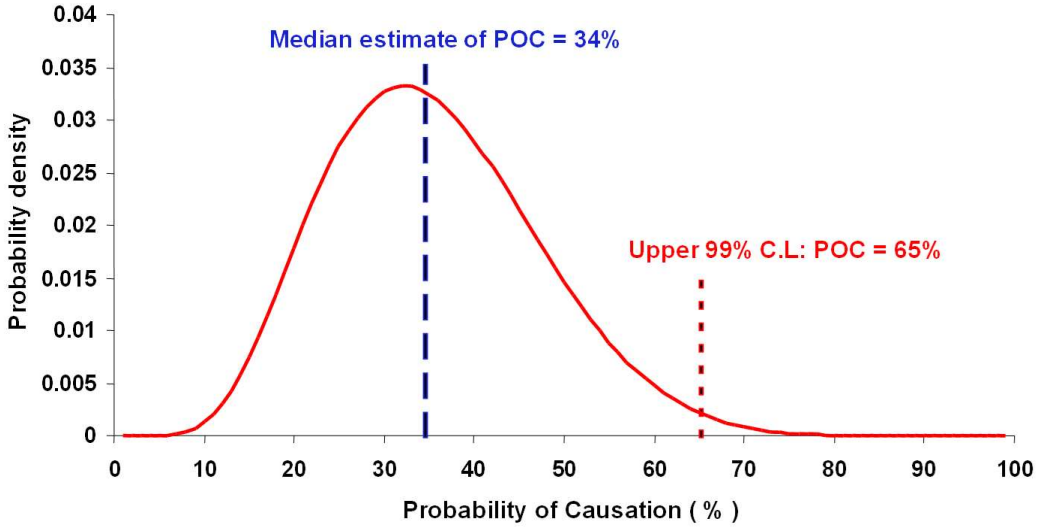
This graph represents the amount of time cases reside with DCAS. The times are measured from the date the case is received from DOL to the date the draft dose reconstructions are sent to the claimants. DCAS goal is to complete dose reconstructions within 5 months of the receipt of the last data required for dose reconstruction. This data could be

6-9 mo 9-12 mo > 12 mo

Probability of Causation

- The Act set the guidelines for determining probability of causation (PC or PoC).
- Eligible for compensation if the cancer was “at least as likely as not” caused by radiation on the job.
- PoC >= 50%

Applying Credibility Limit



Basics of Dose Reconstruction - continued

- **Annual organ doses will be computed from date of first employment (as verified by DOL) to date of diagnosis**
- **When possible, provide an estimate of uncertainty**
- **Dose output will be compatible with the probability of causation software (IREP)**

General Information & Questions

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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.