

Documenting radiation, chemical exposure, & training for workers at the Portsmouth Gaseous Diffusion Plant (GDP)

A report created in collaboration with
USW local 1-689 (Piketon, OH) and the
Tony Mazzocchi Center (Pittsburgh, PA)





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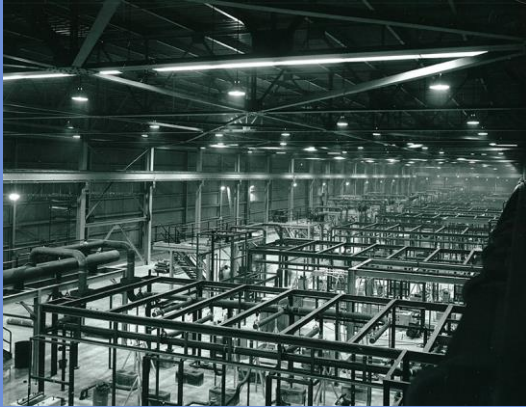


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Background - Site History


- Portsmouth Gaseous Diffusion Plant (PORTS) is a former nuclear site, where enriched uranium was produced for nuclear weapons, submarines, and reactors



Background

Attitudes towards safety and awareness of workplace hazards have evolved over time

Your Eyes And Your Living



WE
E
PROTE

It's hard to realize the hardship of being blind, to perform your regular job and enjoy living in your normal way. SAFETY GLASSES OR GOGGLES whenever needed. Wear them on your forehead, draped around your neck, in your pocket or left on the workbench but OVER YOUR EYES. Wear them in a dusty spot or where there is a possibility of flying particles.

1964



Opportunity for hazards to be missed

Are Their Careers More Important Than Yours?

Johnny Bench wouldn't think of crouching behind the plate without his catcher's mask. O. J. Simpson wouldn't last long without a helmet. Bobby Unser wouldn't dare start an Indianapolis 500 without his helmet and fire-retardant suit.

These men aren't any more in-

1976

- Put on your safety equipment (fall protection for going up high; your hardhat; your safety glasses).
- Wear your ear protection as required.
- Unload the top of a metal storage

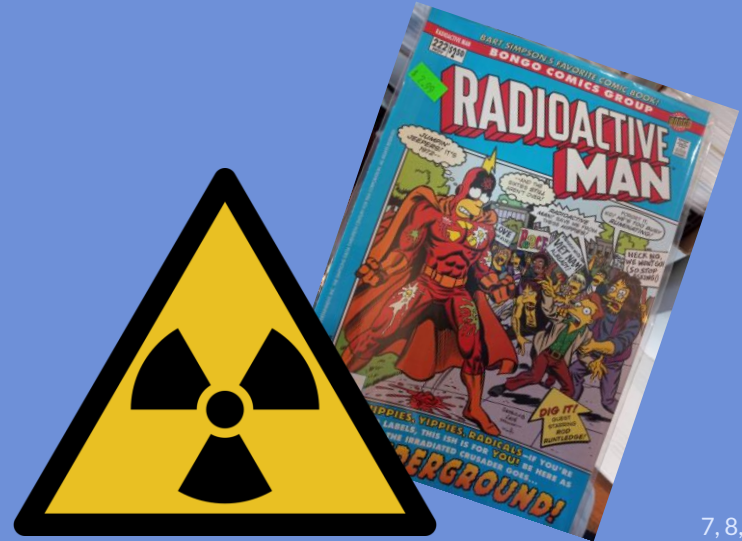


1990

Changes in the 1990s (and early 2000s)

Multiple hazards were identified and begun to be monitored in the 1990s:

- Neutron radiation (1997)
- Transuranic chemicals (e.g. Neptunium, Plutonium, Americium) (~1999)
- Arsenic (1993)
- Beryllium (2004)



- (1) If a covered spouse is alive at the time of payment, such payment shall be made to such surviving spouse.
- (2) If there is no covered spouse described in paragraph (1), such payment shall be made in equal shares to all covered children who are alive at the time of payment.
- (3) Notwith

Technical Documents Used in Dose Reconstruction

A Closer Look at the Research Behind Your Claim

Fact Sheets

Q: When does NIOSH use technical documents in dose reconstruction?

A: If the energy employee's personal radiation information is incomplete, NIOSH will use other sources to estimate the radiation dose. This may involve using technical documents called Site Profiles, Technical Basis Documents

Q: What are Site Profiles?

A: Site Profiles include information used to estimate the radiation dose from other documents.

Q: What are Technical Basis Documents?

A: Technical Basis Documents are documents that form the basis of the work performed to estimate the radiation dose.

Q: What are Technical Basis Documents used for?

A: Technical Basis Documents are used for dose reconstruction.

(d) DEFINITIONS

- (1) The term "employee" means any individual who is employed by the Department of Energy or a contractor or subcontractor of the Department of Energy.
- (2) The term "covered spouse" means the surviving spouse of an employee who was employed by the Department of Energy or a contractor or subcontractor of the Department of Energy at the time of the employee's death.
- (3) The term "covered child" means a child of an employee who was employed by the Department of Energy or a contractor or subcontractor of the Department of Energy at the time of the employee's death.

Dose Reconstruction

A Closer Look at the Research Behind Your Claim

Q: What is dose reconstruction?

A: Dose reconstruction is an estimate of how much radiation an employee was exposed to at a Department of Energy or a contractor or subcontractor of the Department of Energy facility.

Q: Why is NIOSH doing a dose reconstruction?

A: NIOSH is responsible for providing information on radiation dose for the Department of Energy or a contractor or subcontractor of the Department of Energy to the Department of Energy for use in determining compensation.

Q: What information will NIOSH use to estimate the radiation dose?

A: NIOSH may use: film badge readings, incident reports, co-worker reports, documents, interview information, and other information.

Q: How long will it take NIOSH to estimate the radiation dose?

A: There are many steps and each step varies in length to complete the dose reconstruction. Therefore, there is no way to estimate the time to complete the dose reconstruction.

Q: What if NIOSH cannot do a dose reconstruction?

A: NIOSH will notify you in writing that a dose reconstruction cannot be completed for your claim. NIOSH will provide you with information about a different means of compensation that does not require a dose reconstruction called the Special Exposure Cohort. Further information is available on the NIOSH Web site: www.cdc.gov/niosh/ocas.



Contact Information on Back →

Department of Energy contractor employee shall be compensated for a covered illness through exposure to a toxic substance at a Department of Energy or a contractor or subcontractor of the Department of Energy facility, the

average annual wage of that employee for the calendar year determined by that employee's death or the date of exposure to a toxic substance at a Department of Energy or a contractor or subcontractor of the Department of Energy facility, the

thead, the survivor of

paragraph (B), the survivor of this part if the employee's death occurs

Residual Contamination

A Closer Look at the Research Behind Your Claim

- (B) The employee shall receive the greater of the following percentages of the employee's death benefit:
 - (i) \$10,000 multiplied by the number of calendar years determined by that employee's death or the date of exposure to a toxic substance at a Department of Energy or a contractor or subcontractor of the Department of Energy facility, the
 - (ii) \$15,000 multiplied by the number of calendar years determined by that employee's death or the date of exposure to a toxic substance at a Department of Energy or a contractor or subcontractor of the Department of Energy facility, the

Special Exposure Cohort (SEC)

A Closer Look at the Research Behind Your Claim

Fact Sheet

Q: What is the SEC?

A: The SEC is a category of employees established by the Energy Employees Occupational Illness Compensation Program Act of 2000 (EEOICPA). It consists of employees who worked at least 250 days prior to February 1, 1992, at one of the gaseous diffusion plants in Kentucky, Ohio, or Tennessee, or who participated in certain specific underground nuclear tests in Alaska and have any of the 22 specified cancers. A group of employees may be added to the cohort because HHS could not do dose reconstructions with sufficient accuracy and the exposure could have harmed the class.

What are the 22 eligible cancers and work sites?

The 22 eligible cancers and work sites can be considered for inclusion in the Special Exposure Cohort through a petition process run by NIOSH on behalf of the Department of Human Services (HHS).

How do I know if I am a member of the SEC?

To determine if you are a member of the SEC, you should contact NIOSH by phone at 1-800-35-NIOSH.

What compensation am I eligible for if I am a member of the SEC?

As a member of the SEC, you are eligible for compensation as an employee and, in some cases, certain

How do I apply for compensation?

To apply for compensation, you must have worked for a specified period of time at one of the current SEC sites visit www.cdc.gov/niosh/ocas. A Department of Energy employee must also have developed

What are the 22 eligible cancers?

Contact Information on Back →

What is the basis of causation?

The basis of causation is a high estimate of the likelihood or "probability" that the employee's cancer was caused by the radiation exposure at the work site. The calculation gives your claim a "probability" of the doubt.

purposes or compensation shall be determined by that the employee's death or the date of exposure to a toxic substance at a Department of Energy or a contractor or subcontractor of the Department of Energy facility, the

from more than

tion (a) shall



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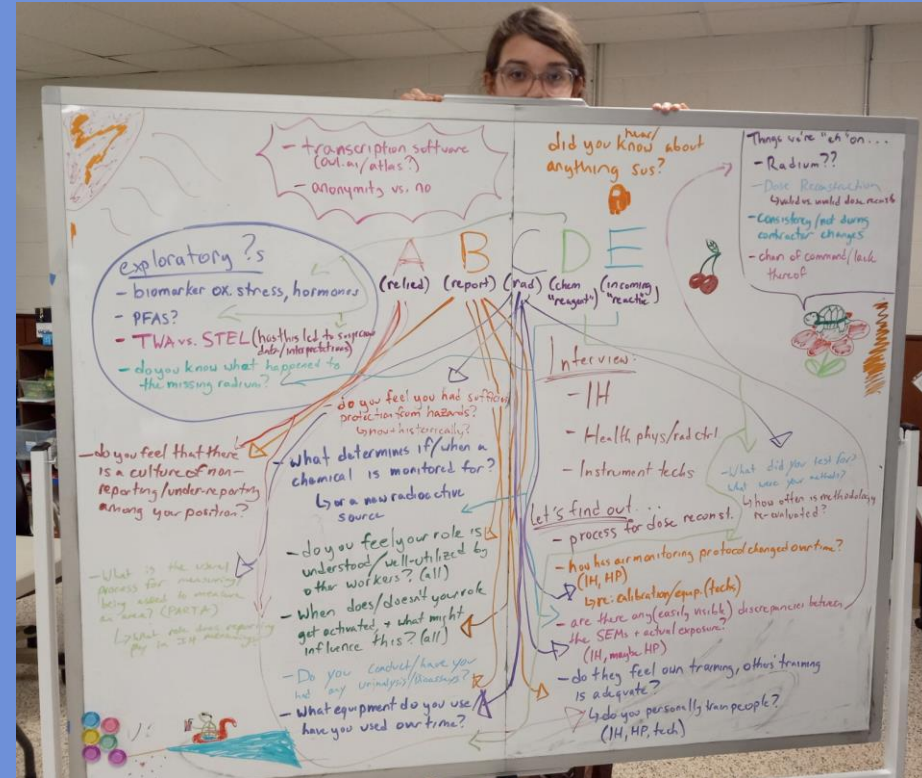
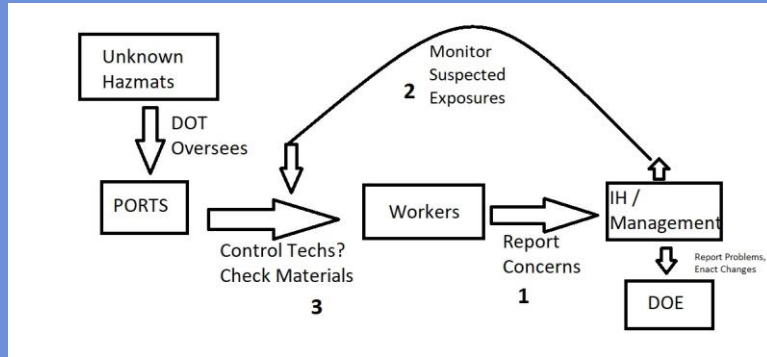
- (c) DETERMINATION of the amount of compensation shall be paid only as follows:



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Should the SEC be
expanded?

Objectives



Case-Building Objectives: Justifying an expansion of the SEC will require a demonstration of widespread faultiness in the quality and quantity of existing exposure data. The following points contribute towards the development of that case.

- Workers' reporting of safety concerns was a critical component of IH's monitoring protocol. *Area #1 on the flow of exposure/response was problematic.*
- Workers were strongly discouraged from reporting safety concerns. *Area #1 on the flow of exposure/response was problematic.*
- In-house radiation monitoring was inaccurate, which may have resulted in underestimation of actual exposure. *Area #2 on the flow of exposure/response was problematic.*
- In-house chemical monitoring was inaccurate, which may have resulted in underestimation of actual exposure. *Area #2 on the flow of exposure/response was problematic. exposure/response was problematic.*
- Incoming potential hazards were not accurately characterized. *Area #3 on the flow of exposure/response was problematic. Area #3 on the flow of exposure/response was problematic.*
- All of the above issues have been prevalent through at least 1992.

Methods

Interviews with Specialized Personnel

*Grounded systems approach, 11 interviewees
whisper.ai transcription software*



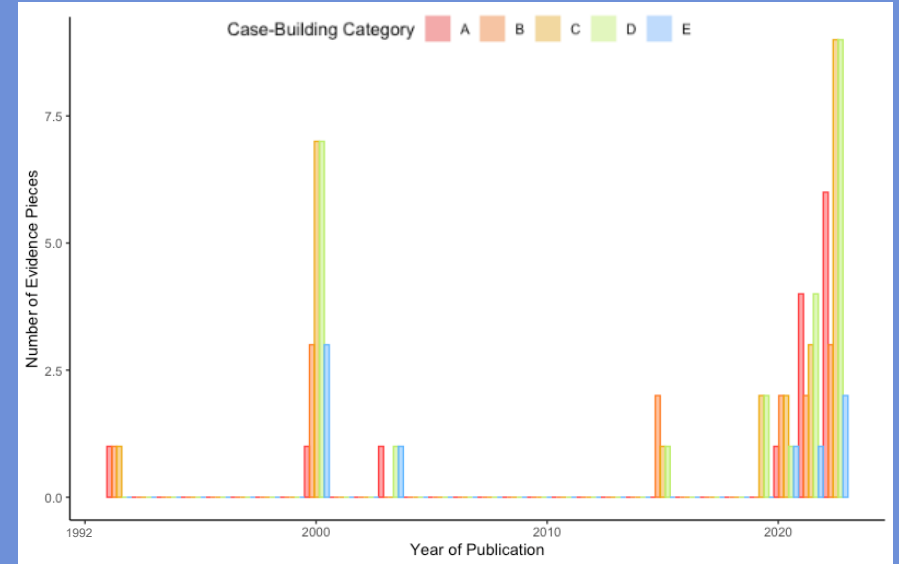
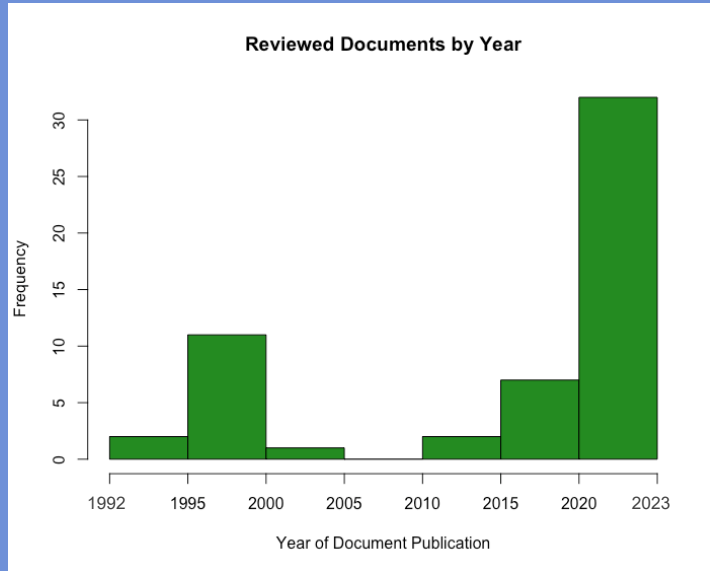
Document Discovery

*Union archives, safety rep. documents, EIC
archives
Assemble a file directory*



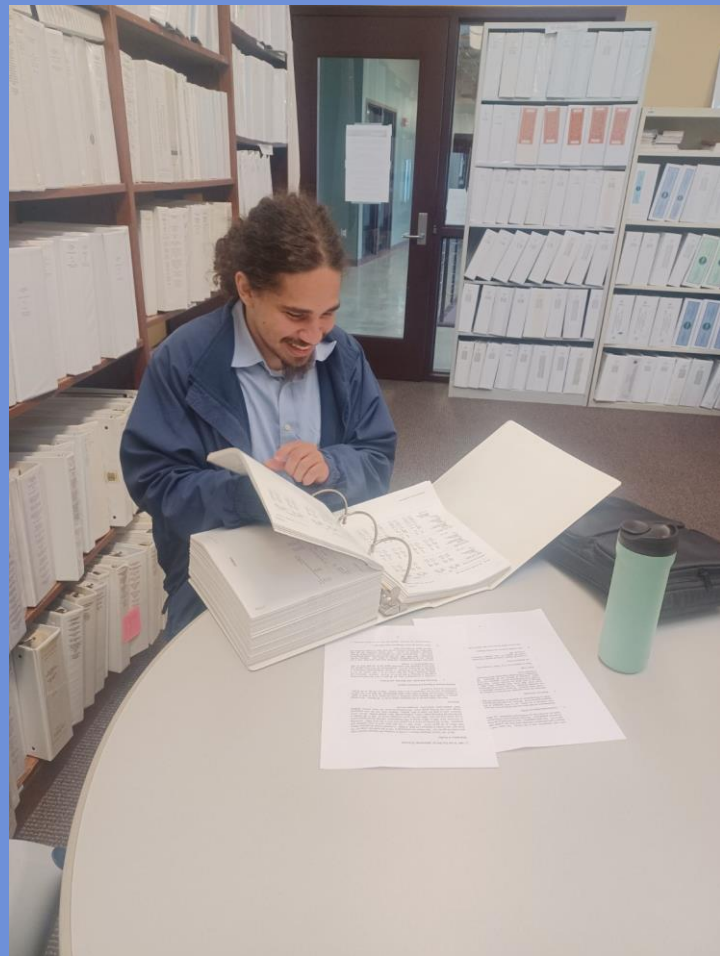
Major Findings

- Found 55 individual documents published in 1992 and beyond supporting all five casebuilding points



- Most interviewees noted deficiencies in training for new hires compared to their initial training
- Confirmed the existence of vast quantities of a previously unmonitored chemical on-site and affirmed its likely use throughout plant history in different locations and contexts

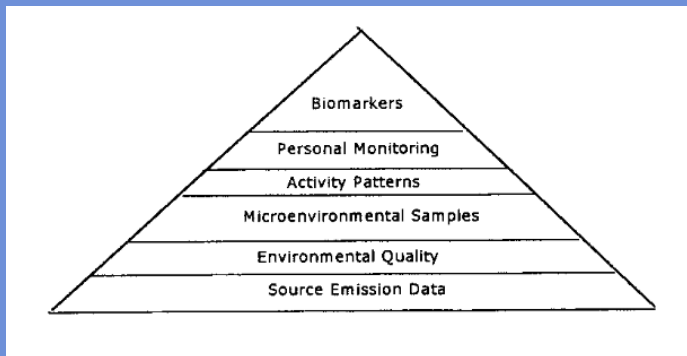
Key Finding: PFAS



Investigating Emerging Hazards

We developed an investigative methodology for future application to novel hazards identified on plant site and applied it to a group of chemicals called PFAS.

This method will allow the union to conceptually approach new hazards more efficiently, which could justify a future SEC expansion



B waste occur. The high enrichment unit is not cur
e process cascade which is designed to further enri
enriched U-235 from the X-330 Process Building
U-235 is further concentrated within the 2,340 di
also houses 60 purge stages to separate the lig
and coolant breakdown products, primarily CF₄) fr



Environmental
Science
Processes & Impacts



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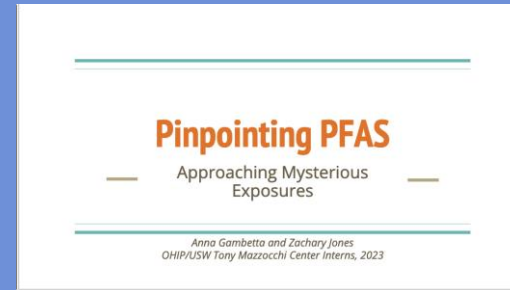
Cite this: Environ Sci: Processes
Impacts, 2020, 22, 2345

An overview of the uses of per- and polyfluoroalkyl
substances (PFAS)[†]

Juliane Klüge,¹ Martin Scheringer,^{2*} Ian T. Cousins,³ Jamie C. DeWitt,⁴
Gretta Goldenman,⁵ Dorte Herzke,⁶ Rainer Lohmann,⁷ Carla A. Ng,⁸
Xenia Trief¹ and Zhanyun Wang¹

Give-Back Products

- Training detailing our framework for identifying novel hazards
- Document containing data about potential PFAS sources by building
- Interview data and transcripts
- Directory containing key documents that may help with casebuilding for SEC



<u>Building name</u>	<u>Function</u>	<u>DDStatus Code (2023)</u>	<u>Potential PFAS sources</u> Highly likely/confirmed PFAS	<u>Additional Notes</u>
X-100	Administration	<u>AboveGDemo</u>	Hydraulics for elevator, waste streams containing solvents, oils, greases.	Oil stains observed "near elevator hydraulic system."
X-100B	Air conditioning equipment building	Active	Waste stream headed to X-720 contains "waste lube oil." Penetrating oil.	Unoccupied
X-101	Health Services building	RDAND	Cleaning solvents and disinfectants, ventilation gaskets, X-ray processing chemicals, gaskets	Cleaning agents <u>not described</u> , X-ray processing chemicals may include PFAS

Recommendations

- Continue to identify evidence to define a timeframe for SEC expansion
 - Suggested areas of focus:
 - Recent deficiencies in training protocol
 - Recent barriers to thoroughness in hazard assessment
 - Identify additional archival documents supporting casebuilding
- Further research/evaluations of PFAS exposure at PORTS
 - Assessment of lubricating oil, coolant, Tyvek suits, and firefighting foam for PFAS
 - Assessment of soil samples throughout the plant site
 - **Laboratory confirmation of excess PFAS on-site is strongly urged**

Frequently Asked Questions

[General Questions](#) [Eligibility](#) [Application](#) [Project Details](#) [Time Commitment](#) [Hosts & Funders](#)

What are the dates for the summer program?

The dates for the nine-week internship is June 20 - August 18, 2023.

U.S. Nuclear Regulatory Commission

NRC Collection of Abbreviations

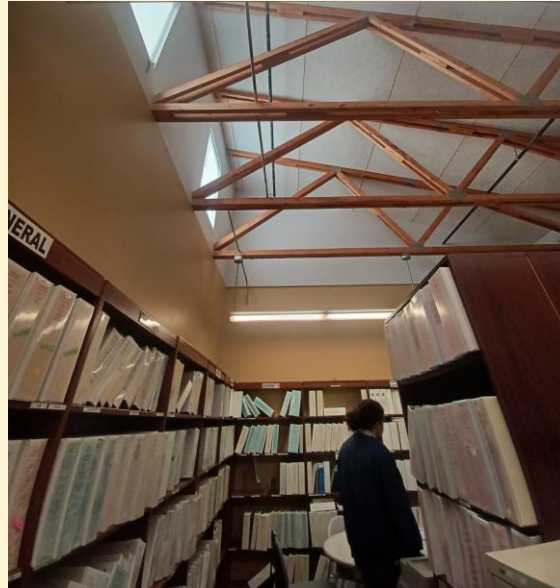
NRC Abbreviations.pdf ☆

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Office of the Chief Information Officer



Challenges





PFAS and WHPP > Inbox x



Steven Markowitz Steven.Markowitz@qc.cuny.edu via cuny907.onmicrosoft.com
to me, Jonathan, Khaula, Sadiyah ▾

Thu, Jul 13, 1:48 PM

Hi, Anna – Thanks for your email about PFAS. WE do not now test for PFAS in blood or urine. We are looking into it as a pilot at 1 or more of our DOE sites. Developing a strategy and protocol will take some time. Please feel free to check back with us in a couple of months.

We look forward to hearing more about your OHIP work this summer.

Thx

Steven Markowitz MD



Successes



HIGHEST PRIORITY. IMPORTANT. INFORMATIVE. INTERESTING. FINE TO ASK.

1- All: Logistical

What year did you begin work at the plant?

Can you list what positions you have held over time?

When you worked in **industrial hygiene/health physics/ as a radiation technician**, which locations did you work in?

2-IH Rad/HP: Characterizing daily protocol

What were the day-to-day responsibilities of your job in/as IH/HP/Instrument/RCT?

What specific hazard or hazards did you look for, and how did you test for it or them?

Did hazard-testing protocol or policy change throughout the time of your employment?

What determined if a hazard needed to be tested for? What determined if a hazard didn't need to be tested for? Did this change over time?

How often did your team assess for fugitive emissions? **a fugitive emission is when something you think you've controlled and removed from the environment is leaking back into the environment to potentially expose people.**

3- IH Rad/HP: Characterizing response protocol

For people involved in direct response: Can you walk us through the process of being called out

Personal Reflections

With Zach and Anna



Special thanks to:

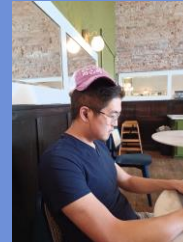
Everyone at USW Local 1-689



Our mentors from the Tony Mazzocchi Center and OHIP



& other sources of support



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