

# **NIOSH Response to “Interim SC&A Review of the SEC Petition Evaluation Report for Petition SEC-00256: Pinellas Plant”**

**Response Paper**

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**National Institute for Occupational  
Safety and Health**

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## **INTRODUCTION**

NIOSH completed the Petition SEC-00256, *Pinellas Plant Special Exposure Cohort (SEC) Petition Evaluation Report (SEC-00256 ER)* [NIOSH 2021a] on October 13, 2021. At its December 8, 2021, meeting [NIOSH 2021b, PDF p. 53], the Advisory Board on Radiation and Worker Health (ABRWH, Board) requested that SC&A review the *SEC-00256 ER*. NIOSH received SC&A's *Interim SC&A Review of the SEC Petition Evaluation Report for Petition SEC-00256: Pinellas Plant* [SC&A 2023], dated June 16, 2023. In their Executive Summary, SC&A noted:

*...several new issues have recently been raised by the petitioners that may have SEC implications (e.g., potential uranium glass blowing operations) and that documents found in recent data captures have not yet been reviewed. However, SC&A is releasing this interim draft to inform the Board and to facilitate moving discussions forward. [SC&A 2023, PDF p. 9]*

SC&A also indicated the following:

*While SC&A's review had no findings, it made the following 13 observations, which may reflect either unfavorably or favorably or provide noteworthy information on the radiation-related conditions and practices at Pinellas and the conclusions of the ER. [SC&A 2023, PDF p. 10]*

In this response paper, NIOSH addresses the 13 observations raised in the SC&A interim review [SC&A 2023, PDF pp. 9–13]. The first five observations were based on a review of the *SEC-00256 ER* itself, and the remaining observations were taken from SC&A's review of the 1990 Tiger Team Report [DOE 1990].

## **NIOSH RESPONSES TO SC&A OBSERVATIONS**

In the sections below, NIOSH presents SC&A's 13 observations with a detailed response following each.

### **SC&A Observation 1: Neutron generator production was fairly steady**

*SC&A's review of neutron generator production from 1974 through 1993 showed that it was fairly steady, with a peak in the early 1980s and a few notable dips in the late 1970s into 1980. (section 3.1) [SC&A 2023, PDF pp. 10, 21]*

### **NIOSH Response to SC&A Observation 1:**

NIOSH concurs with this Observation.

### **SC&A Observation 2: Potential for tritium contamination is adequately addressed**

*SC&A notes that key aspect 4 of the accepted NIOSH stable metal tritide model indicates that stable metal tritide exposures would only be applied if the energy employee were also monitored via urinalysis. However, given the deficiencies noted by the Tiger Team in the performance of the bioassay program as late as 1990, relying on bioassay completeness to establish exposure potential is likely inappropriate. (section 3.3.1) [SC&A 2023, PDF pp. 10, 27]*

### **NIOSH Response to SC&A Observation 2:**

At issue is the identification of claimants potentially exposed to stable metal tritides (SMT) and the subsequent assignment of the SMT exposure to those individuals. Tritium bioassay data is only one of the sources of information used by dose reconstruction personnel in designating individuals as potentially exposed to SMT. If bioassay data are available for a claimant, that claimant will automatically be assigned SMT dose. However, for an unmonitored individual, the totality of information available to the dose reconstructor is used to determine if an individual *should have been* monitored, with appropriate dose assignments to be made after that determination is made.

Following the ABRWH and SC&A review of the *SEC-00256 ER*, NIOSH will update *Pinellas Plant – Occupational Internal Dose*, ORAUT-TKBS-0029-5 [Oak Ridge Associated Universities Team (ORAUT) 2016] to include a discussion of how to determine exposure potential for unmonitored personnel. Based on this Observation, NIOSH will also add the following clarification:

When periods are identified during which an individual claimant should have been monitored but was not, internal dose from insoluble tritium (based on the methodology in section 5.8.1.2) will be included in addition to soluble tritium dose.

### **SC&A Observation 3: The ER does not reference recent special tritium compound document**

*The SEC evaluation report and ORAUT-TKBS-0029-5, revision 03 (the occupational internal dose technical basis document (TBD)), do not incorporate guidance for performing dose reconstruction for intakes of stable metal tritides from revision 01 of ORAUT-OTIB-0066 (2020). NIOSH should commit to reference and discuss guidance from OTIB-0066 in the next revision of the occupational internal dose TBD and evaluate whether it has any consequential effect on the SEC evaluation report conclusions. In addition, as noted in key aspect 2 of the stable metal tritide model accepted by the Board (as presented by SC&A at the August 9–10, 2016, Board meeting), sitewide air monitoring data or contamination survey data should be preferentially used over other modeling in dose reconstructions for stable metal tritides whenever available. (section 3.3.1) [SC&A 2023, PDF pp. 10, 27]*

### **NIOSH Response to SC&A Observation 3:**

SC&A correctly observed in their review:

*...as noted in key aspect 2 of the stable metal tritide model accepted by the Board (as presented by SC&A at the August 9–10, 2016, Board meeting), sitewide air monitoring data or contamination survey data should be preferentially used over other modeling in dose reconstructions for stable metal tritides whenever available [SC&A 2023, PDF pp. 10, 27].*

Section 2.0 of the document *Calculation of Dose from Intakes of Special Tritium Compounds*, ORAUT-OTIB-0066 [ORAUT 2020a] indicates that the use of workplace information is preferred over the use of urinalysis. Consistent with this guidance, NIOSH has adopted a methodology for Pinellas based on **sitewide** contamination data [ORAUT 2016]. This methodology has received the concurrence of both the ABRWH and SC&A [NIOSH 2016b, PDF p. 83].

ORAUT-OTIB-0066 [ORAUT 2020a] does not have any consequential effect on the SEC-00256 ER [NIOSH 2021a]. OTIB-0066 states “*Ideally, workplace information, in the form of air monitoring, surface contamination activity, and process knowledge are used to assign potential intakes of this material, which is addressed in a site profile when possible*” [ORAUT 2020, PDF p. 6]. This statement supports the current sitewide methodology used for Pinellas. Nevertheless, NIOSH agrees that it is appropriate to include a reference to ORAUT-OTIB-0066 [ORAUT 2020a] along with an affirmation that the implemented methodology is consistent with OTIB-

0066 guidance. NIOSH will incorporate that information in the TBD *Pinellas Plant – Occupational Internal Dose* [ORAUT 2016] when it is next revised.

#### **SC&A Observation 4: Lack of bioassays records for 1988–1990**

*Despite between 129 and 201 employees reportedly monitored by bioassays from 1988 to 1990, NIOSH only has monitoring records for 3–10 claimants per year. According to the 1990 DOE Tiger Team report, approximately 1,750 people were employed in 1989, suggesting that monitoring records are missing. (section 4.3) [SC&A 2023, PDF pp. 10–11, 37]*

#### **NIOSH Response to SC&A Observation 4:**

The records information cited by SC&A was derived from Tables 6-1 and 6-2 of the *SEC-00256 ER* [NIOSH 2021a, PDF pp. 47–49]. Table 6-1 was developed by querying dose reconstruction claims files. The original query looked at a working file that is developed in preparation for the dose reconstruction process. This working file compiles the internal monitoring data for a claim. Because this compilation of data is not necessarily a complete picture of the final data used in a dose reconstruction, querying this specific claim document was not the appropriate way to determine the entries for Table 6-1 of the ER. In this case, Pinellas used a different reporting scheme in their files from 1988 to 1990, which led to some data being overlooked and not transcribed into the dose reconstruction preparation file. Because the data preparation file was the source of the information used in Table 6-1, the data presented in Table 6-1 for those years was incomplete, as SC&A pointed out. Again, this issue did not impact the dose reconstruction process, because the actual dose reconstructions used all the available data. This issue specifically impacted how Table 6-1 of the ER was developed.

NIOSH will not retroactively update the ER but has updated the 1988, 1989, and 1990 tabulation (see Table 1, below) to include all bioassay data used in each individual dose reconstruction report, as well as data received since the dose reconstruction was performed. It is worth noting here that monitoring data received after the completion of a dose reconstruction report is periodically evaluated to determine the impact on each individual claim probability of causation (POC) determination. If the POC changes (from <50% to >50%), NIOSH notifies the Department of Labor and asks for the claim to be returned for a revised dose reconstruction.

Table 1 below provides an update for the Pinellas Plant based on the complete 1988, 1989, and 1990 bioassay data collection. Using this collection, the number of Pinellas claimants reported to have been monitored by tritium bioassay now ranges from 22 to 35 from 1988 to 1990, rather than 3 to 10 as reported in the *SEC-00256 ER* [NIOSH 2021a, PDF p. 48]. As shown below in Table 1, for 1988, 1989, and 1990, the percentage of all Pinellas employees monitored by bioassay was 7.5%, 11.8% and 10.7%, respectively; the percentage of the population of claimants monitored by bioassay was 7.1%, 11.7%, and 8.0%, respectively. The percentage of Pinellas claimants monitored by bioassay is similar to the percentages of employees monitored

by bioassay as reported by Pinellas for 1988–1990. The monitoring frequency for the Claims Tracking System (NOCTS) dataset is no longer inconsistent with that for the site population.

Table 1. Tritium bioassay data for Pinellas employees, 1988 to 1990.

Year	Total Site Personnel <sup>a</sup>	Employees (#) Monitored by Bioassay <sup>b</sup>	Employees (%) Monitored by Bioassay	Pinellas Claimants in NOCTS <sup>c</sup>	Pinellas Claimants (#) Monitored by Bioassay <sup>d</sup>	Pinellas Claimants (%) Monitored by Bioassay <sup>d</sup>
1988	1720	129	7.5%	310	22	7.1%
1989	1700	201	11.8%	299	35	11.7%
1990	1650	177	10.7%	288	23	8.0%

<sup>a</sup> Sources: 1988 [GE 1989], 1989 [GE 1990], and 1990 [DOE 1991]

<sup>b</sup> [Weaver 1992, PDF p. 12]

<sup>c</sup> As of the *SEC-00256 ER* [NIOSH 2021a] (through NOCTS Claim #53368)

<sup>d</sup> Data derived from [Tritium Bioassay Results 1988], [Bioassays and Recounts 1989], [Personnel Bioassay Results 1990]. NOCTS update [ORAUT 2023].

### SC&A Observation 5: Bioassay schedule noncompliance by the plant

*One of the principal Tiger Team findings relevant to the SEC petition was noncompliance with the plant's own requirements for termination, monthly, and weekly bioassays. Appropriate bioassay compliance (data completeness levels) in general is a subjective judgment to be made by the Board. In addition, the level of compliance with the bioassay program is unknown before the findings of the Tiger Team. It is SC&A's opinion that at a minimum, NIOSH should demonstrate that an appropriate co-exposure model can be constructed to address apparent incompleteness in the tritium bioassay program (likely throughout its relevant operating history). Despite concerted efforts by the site to rectify the compliance issues, nearly one-fifth of worker bioassay requirements were still not met. Bounding co-exposure values would certainly appear warranted during this latter period (1991–1997). (section 4.3) [SC&A 2023, PDF pp. 11, 39]*

### NIOSH Response to SC&A Observation 5:

NIOSH does not believe that the demonstration of a co-exposure model is necessary to address the "apparent incompleteness in the tritium bioassay program." The Tiger Team's report was a basis for the *SEC-00256 ER* [NIOSH 2021a] which evaluated and affirmed NIOSH's ability to accomplish dose reconstruction for Pinellas Plant workers even when considering these non-compliance issues.

Since SC&A did not comment on the evaluation outlined in the *SEC-00256 ER*, it is summarized below for renewed consideration.

1. The total internal dose and the average individual tritium dose generally followed a downward trajectory from 1986 through 1990 and continued in the same direction through the end of reporting in 1995 when the Pinellas Plant was undergoing D&D work.



Therefore, the increase in bioassay compliance achieved in response to the DOE Tiger Team findings did not lead to an increase in the Pinellas Plant's total measured internal dose or the average individual internal dose, as might be expected if the bioassay program had missed identifying significant exposures [NIOSH 2021a, PDF p. 63].

2. According to the findings of the 1990 Tiger Team report, this group of workers, who were generally sampled daily or weekly, was more compliant with the sampling program than the workers with lower exposure potential, who were sampled on a monthly frequency. This finding indicates that the monitoring data that is available would likely be biased high due to the larger fraction of missing data from the workers with lower exposure potential. In turn, any unmonitored dose approach based on the monitored workers would also be biased high [NIOSH 2021a, PDF p. 63].
3. NIOSH reviewed NOCTS claimant files for individuals who worked prior to 1990. NIOSH confirmed that the workers that would be expected to have had a potential for internal tritium exposure (e.g., those with hands-on tritium work or tritium-equipment or systems-maintenance responsibilities) were in fact monitored [NIOSH 2021a, PDF p. 63].
4. NIOSH reviewed NOCTS files to evaluate bioassay compliance and found that the lack of any clear indication of when a urine sample had to be submitted made it impossible to quantify the degree of compliance with bioassay schedules for each former worker. However, NIOSH analyzed the number of urinalysis results each year for each claimant to identify indications of volatility in the number of samples submitted from 1957 through 1989. This analysis of the data identified only four claims that seemed to be more variable than the others, having significant changes in the numbers of samples given from one year to the next, and worth further review in detail. The four claim records were for a lab technician, a maintenance craftsman, a development physicist, and a neutron tube technician. All of these were jobs that NIOSH would expect to be on a weekly to monthly urine sample schedule. NIOSH reviewed these claims and determined that the worker monitoring appeared consistent with the job responsibilities and exposure potential for these workers [NIOSH 2021a, PDF p. 64].
5. The Tiger Team audit document does not include references, specific data, or documentation to support the finding related to bioassay procedure compliance; therefore, NIOSH must assess its statements at face value. During interviews with former workers and DOE oversight staff, NIOSH asked participants to identify the cause of bioassay non-compliance. Of the 15 former Pinellas workers and DOE oversight staff who were interviewed specifically on the topic of participation in the bioassay program, all stated that they did not know of workers not submitting samples as requested [ORAUT 2020b,c,d,e,f,g,h,i,j,k, 2021a,b,c,d,e]. Although they did not know of workers who were not submitting samples, the responses on possible causes ranged widely. A former worker who had participated in the Tiger Team audit said the Plant set the 80% participation goal in response to the audit, and that non-participation was sometimes a

result of workers being on leave during their scheduled sample period [ORAUT 2020b, PDF p. 7]. This same former worker informed NIOSH that there were support personnel who entered a production area on a non-routine basis, whom the site assigned to the bioassay sample program for routine sampling instead of only requiring the worker to provide a sample upon leaving the tritium area. Providing a sample when exiting a radiological area was the Plant's protocol for non-routine entries involving exposure potential. Thus, according to the interviewee, there were a large number of people who remained on the routine sampling program after it was no longer appropriate [ORAUT 2020b, PDF p. 6]. A Radiation Control Compliance document from 1993 reports that the system used to document participation did not accurately track the reason samples were not submitted (i.e., vacation, sick leave, reassignment, or "just forgot") [Martin Marietta 1993, PDF p. 6]. Therefore, NIOSH doesn't have any evidence or indication of a single root cause of non-compliance with the requirement to submit a bioassay sample. It is unlikely that the non-compliance issue was a systemic problem, and there is no indication it was widespread among the workers. Therefore, the bioassay compliance issue does not impact NIOSH's ability to develop a dose reconstruction approach based on the available monitored worker data [NIOSH 2021a, PDF p. 64].

6. NIOSH currently applies the 95<sup>th</sup> percentile whole body dose to all Pinellas claimants who were potentially exposed to photons or neutrons and were unmonitored for external exposure. NIOSH determined that the use of an unmonitored approach, based on the 'whole body' dose, as a surrogate for the internal dose component is appropriate and claimant-favorable when alternative approaches are not viable. NIOSH will update *Pinellas Plant – Occupational Internal Dose*, ORAUT-TKBS-0029-5 [ORAUT 2016] following the review of the *SEC-00256 ER* by the ABRWH and SC&A. This update will include a discussion of how to determine exposure potential for unmonitored workers or workers with large gaps in dosimetry, as well as a discussion of available approaches to bound internal dose [NIOSH 2021a, PDF p. 66].

In summary, the Pinellas Plant improved worker compliance with urine sample submission frequency following the 1990 Tiger Team report, and NIOSH found that measured doses did not increase as a result of improved compliance. This result indicates there was no significant dose that went unmonitored when workers sometimes did not turn in the urine samples according to procedure. NIOSH's review of claimant records indicates that tritium bioassay data are available for the workers most likely to have been exposed during the period under evaluation. Bioassay data are available for the time period, for the personnel who worked in the areas, doing the jobs that NIOSH considers to have the potential for radiation exposure. NIOSH will update the site profile document, *Pinellas Plant – Occupational Internal Dose*, ORAUT-TKBS-0029-5 [ORAUT 2016] to further explain the approaches for determining internal tritium dose for unmonitored personnel and how NIOSH will use those approaches to bound internal dose based on claim information, job title, and monitoring history.



### **SC&A Observation 6: Radiological protection program commended by Tiger Team**

*On a positive note, commending the radiological protection program, section 4.4.11.1 (p. 4-90) of the 1990 DOE Tiger Team report states, “The overall assessment is that all levels of the GEND [General Electric Neutron Devices, another name for the Pinellas Plant] organization are receiving adequate radiological protection. This is primarily due to a GEND staff that appears willing to accept line responsibility for radiological safety along with a technically strong health physics staff providing direction.” [SC&A 2023, PDF pp. 11, 39]*

### **NIOSH Response to SC&A Observation 6:**

NIOSH concurs with this Observation.

### **SC&A Observation 7: Bioassay sampling frequency requirements not followed as noted by Tiger Team**

*Section 4.5.11.1 (p. 4-90) of the 1990 DOE Tiger Team report compliments the plant for maintaining low overall internal dose exposures but also makes an important finding on noncompliance issues related to the plant not following bioassay sampling frequency requirements. This is one of the bases cited in the SEC petition: “Occupational internal exposures are low compared to other DOE sites. This accomplishment results from a conservative approach to working with tritium and through extensive use of engineering controls. However, compliance with the rules on providing bioassay samples at specified frequencies has not been satisfactory.” [SC&A 2023, PDF pp. 11, 40]*

### **NIOSH Response to SC&A Observation 7:**

NIOSH concurs with this Observation. Indeed, the cited Tiger Team finding was the basis for the qualification of the Pinellas SEC Petition [NIOSH 2020]. Additional discussion on the bioassay compliance issue reported by the Tiger Team [DOE 1990] and evaluated in the *SEC-00256 ER* [NIOSH 2021a] is included in the response to Observation 5.

### **SC&A Observation 8: Contamination controls found generally good by Tiger Team**

*Section 4.5.11.1 (p. 4-91) of the 1990 DOE Tiger Team report discusses the effectiveness of contamination controls at Pinellas and notes that while it is generally good, there are instances when it is not: “Contamination controls are generally good. Contamination levels within the work areas are kept low and generally confined to the source. Indications were found that proper contamination control techniques are not always being followed, in some areas causing contamination spread to the general areas of the facility.”*

*Section 4.5.11.2 (p. 4-101) continues the discussion of contamination controls with a negative statement: “Proper contamination control techniques are not being followed by personnel when working in and exiting from Contaminated Areas.” The report (p. 4-102) notes that a contractor disagreed that workers were inadequately protected given the extremely low contamination levels detected and that “radiation exposures from these contamination levels are not measurable, as supported by bioassay sampling.” [SC&A 2023, PDF pp. 11–12, 40]*

### **NIOSH Response to SC&A Observation 8:**

As noted above, the Tiger Team Assessment of the Pinellas Plant stated: “Contamination controls are generally good. Contamination levels within the work areas are kept low and generally confined to the source” [DOE 1990, PDF p. 217]. Additional complimentary commentary from DOE 1990 included:

- *The overall assessment is that all levels of the GEND [General Electric Neutron Devices, another name for the Pinellas Plant] organization are receiving adequate radiological protection. This is primarily due to a GEND staff that appears willing to accept line responsibility for radiological safety along with a technically strong health physics staff providing direction.” [DOE 1990, PDF p. 216] (See also SC&A Observation 6)*
- *Occupational internal exposures are low compared to other DOE sites. This accomplishment results from a conservative approach to working with tritium and through extensive use of engineering controls.” [DOE 1990, PDF p. 217] (See also SC&A Observation 7)*

The Tiger Team characterization of contamination controls being ‘generally good’ would seem to speak to the overall working conditions within the Pinellas Plant. The negative Tiger Team statements [DOE 1990, PDF pp. 217, 227] cited in SC&A Observation 8 are related to an instance of surface contamination on a step-off pad and adjacent hallway [DOE 1990, PDF p. 227] and would represent a transient condition. Based on the general Tiger Team remarks on the Pinellas Radiation Protection Program, it is unlikely that such conditions were frequent.

The Tiger Team report [DOE 1990] made note of the contractor comments to that effect:

*It is the contractor’s position that...:*

*1) calculations will show that radiation exposures from these contamination levels are not measurable, as supported by bioassay sampling; and*

*2) contamination levels which could cause measurable exposures are well controlled at the source. This is supported by routine work and contamination area surveys, which show that routine contamination levels within these zones are not significantly above uncontrolled area limits. [DOE 1990, PDF p. 228]*

NIOSH does not believe that such transient conditions represent a challenge to reconstructing internal dose for claimants under the Energy Employees Occupational Illness Compensation Program Act of 2000 (EEOICPA). The contamination control limits used for controlled areas (440 dpm/100 cm<sup>2</sup> [GE, no date; PDF p. 3]) and uncontrolled areas (220 dpm/100 cm<sup>2</sup> [Burkhart 1989, PDF p. 2]) are well below the values generally defined for contamination areas (10,000 dpm/100cm<sup>2</sup>) [10 C.F.R. 835] and represent a nominal internal dose potential. The average internal dose for all monitored workers between 1988 and 1991 ranged between 1.04 and 4.38 mrem/year [Weaver 1992, PDF p. 11] and would include any exposure from plant-wide surface contamination.

### **SC&A Observation 9: Bioassay sampling program implementation inadequacies noted by the Tiger Team**

*Section 4.5.11.2 (p. 4-98 ff.) of the 1990 DOE Tiger Team report contains several radiological protection findings and concerns related to internal dosimetry that are relevant here. Of particular importance, finding RP.7 (p. 4-98) claims that “Procedural requirements have not been established for an employee’s termination bioassay, nor a system developed to identify and address those individuals who fail to provide a bioassay sample.” Additionally, “GEND estimated that 20 percent of the personnel that terminated in 1988 did not provide a termination bioassay,” and that “Individual workers, their supervisors, and management are not ensuring that required bioassay samples are provided. In 1989, bioassay samples were not submitted in accordance with GEND procedures. Seventy percent of the required monthly samples and 35 percent of the required weekly samples were not submitted.” NIOSH cited these Tiger Team findings as sufficient to qualify the SEC petition for further evaluation.*  
[SC&A 2023, PDF p. 12, 40]

### **NIOSH Response to SC&A Observation 9:**

NIOSH concurs with this Observation. As noted above by SC&A, the cited Tiger Team finding was the basis for the qualification of the Pinellas SEC Petition [NIOSH 2020]. Additional discussion on the bioassay compliance issue reported by the Tiger Team [DOE 1990] and evaluated in the *SEC-00256 ER* [NIOSH 2021a] is included in the response to Observation 5.

### **SC&A Observation 10: Tiger Team assessment of deficiency root causes: emphasis on production and mindset that Pinellas poses no unusual radiological risks**

*Section 5.7 (p. 5-33) of the 1990 DOE Tiger Team report covers management assessments. It opines the following on the probable root causes of some of its deficiency findings and lists the following two: “First, emphasis on production has traditionally overshadowed interest in fully complying with environment, safety and health*

*requirements”; and “Second, there is a wideset mindset that the Pinellas Plant poses no unusual or unique risks.” [SC&A 2023, PDF p. 12, 40]*

### **NIOSH Response to SC&A Observation 10:**

The Management Assessment portion of the Tiger Team Evaluation [DOE 1990, PDF pp. 287–319] identified 16 findings, none of which specifically identified issues with the Pinellas Radiation Protection Program. The text cited in Observation 10 was extracted from the ‘Probable Root Causes’ section [DOE 1990, PDF p. 319] and is related to the identified management deficiencies, none of which impacted the ability of Pinellas to accurately monitor personnel radiation exposure.

In fact, as noted in the response to Observation 8, the Tiger Team assessment included a number of complimentary statements specific to the radiation protection program:

- *The overall assessment is that all levels of the GEND [General Electric Neutron Devices, another name for the Pinellas Plant] organization are receiving adequate radiological protection. This is primarily due to a GEND staff that appears willing to accept line responsibility for radiological safety along with a technically strong health physics staff providing direction. [DOE 1990, PDF p. 216] (See also SC&A Observation 6).*
- *Occupational internal exposures are low compared to other DOE sites. This accomplishment results from a conservative approach to working with tritium and through extensive use of engineering controls. [DOE 1990, PDF p. 217] (See also SC&A Observation 7).*

It is NIOSH’s position that this observation does not imply a deficiency in the ability of Pinellas to accurately monitor personnel radiation exposure, nor a deficiency in the program’s ability to determine potential dose.

### **SC&A Observation 11: Transition Year of 1990 after Tiger Team assessment led to overall reduced exposures**

*The Tiger Team assessment took place in January and February 1990, and the Pinellas Plant initiated corrective action during fiscal year 1990 (October 1, 1989, through September 30, 1990). While data indicate a significant decrease for external doses from 1990 to 1991, there was an increase in internal doses from tritium from 1990 to 1991, then a gradual decreasing trend during the years 1992–1995. The number of workers bioassayed for tritium remained reasonably consistent during the period 1986–1995, and the number of workers monitored for external exposure gradually decreased during the period 1985–1995. According to the “1991 Annual ALARA Program Report for Ionizing Radiation,” the increase in internal dose was due to the “T” box incident and recovery operations in Area 182C conducted in late December 1991. To date, SC&A has not found*

*indications that there are issues with exposure records that would prevent DR feasibility for the SEC period 1957–1990, nor for the period 1991–1997. (section 4.5) [SC&A 2023, PDF p. 12, 41]*

### **NIOSH Response to SC&A Observation 11:**

NIOSH concurs with this Observation.

### **SC&A Observation 12: ER is consistent with interview records**

*SC&A reviewed all available documented communication (i.e., interview) records. The interviews reflect the full date range of work at Pinellas and encompass a broad range of professions. From the interviews, it is clear that site employees had a different experience with the health and safety policies at the site based on their role and job function. In general, the interviewed workers in physics, engineering, chemistry, and lab-related professions had experience with the site internal and external monitoring program. The recollections reported in the interviews, in general, are consistent with the NIOSH SEC evaluation report. (section 5.4) [SC&A 2023, PDF pp. 12–13, 44]*

### **NIOSH Response to SC&A Observation 12:**

NIOSH concurs with this Observation.

### **SC&A Observation 13: Pinellas plant diligent in following up on contamination-related incidents**

*Based on its review of the available incident information, SC&A concurs with NIOSH's conclusion that Pinellas Plant was diligent about following up on contamination-related incidents and personnel exposures. The reports show investigations into the causes of various incidents, and most (1) indicate that followup monitoring was performed for employees involved in the incidents and (2) provide recommendations to prevent the incidents from reoccurring. However, given the lack of bioassay records for the years 1988–1990 described in observation 4 (section 4.3) and the issues surrounding bioassay noncompliance described in observation 5 (section 4.3), observation 7 (section 4.4), and observation 9 (section 4.4), it is possible that the program may not have captured all the internal exposures related to contamination incidents. (section 6.2.2) [SC&A 2023, PDF pp. 13, 49]*

### **NIOSH Response to SC&A Observation 13:**

NIOSH has evaluated the issues related to missing bioassay data (Observation 4) and has concluded that there is no indication that bioassay data is missing. Similarly, NIOSH has addressed the issue related to bioassay compliance (Observations 5, 7, and 9) and has concluded

there is no impact to the feasibility to reconstruct internal dose at the Pinellas Plant. With these issues resolved, the assertion “the program may not have captured all the internal exposures related to contamination incidents” is unsupported. As stated in Observation 11, “To date, SC&A has not found indications that there are issues with exposure records that would prevent DR [dose reconstruction] feasibility for the SEC period 1957–1990, nor for the period 1991–1997.”

## **CONCLUSION**

Based on the evaluation of the 13 Observations made by SC&A in their Interim Review [SC&A 2023], NIOSH finds that none of the Observations contradict the conclusions presented in the *SEC-00256 ER* [NIOSH 2021a].



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