



SC&A Response to Pinellas Plant Issues Raised at the January 29, 2026, Work Group Meeting

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Introduction

- ◆ The Pinellas Work Group (WG) and Authorized Petitioner Representative (APR) are concerned whether any consequential personnel exposures to plutonium, uranium, or other radioisotopes have been overlooked
- ◆ The APR prepared a “weight of evidence paper for special cohort class,” January 14, 2026, and presented it at the January 29, 2026, WG meeting
- ◆ The National Institute for Occupational Safety and Health (NIOSH) responded to the APR’s paper on March 25, 2026
- ◆ SC&A responded to the APR’s paper and other concerns of Board members expressed at the WG meeting on August 17, 2026

Background

- ◆ APR claims that the NIOSH Special Exposure Cohort (SEC)-00256 petition evaluation report does not adequately demonstrate NIOSH's ability to reconstruct radiation doses
- ◆ SC&A's report responds point-by-point to the APR's paper and addresses related WG concerns
- ◆ SC&A notes that previous evaluations and discussions of methods and data, including SC&A's 2023 interim review report and 2025 supplemental review report:
 - Have already addressed many of the APR's concerns
 - Consistently concluded that dose reconstruction can be performed with sufficient accuracy



Bottom line

- ◆ SC&A finds no new evidence changing the conclusion that dose reconstruction for Pinellas is feasible
- ◆ The APR paper raises legitimate questions worth investigating — SC&A took each one seriously
- ◆ Review finds none of the claims identify an unmonitored or unaccounted-for exposure pathway that affects dose reconstruction

Topics covered

APR Paper Concerns

- ◆ Tritium
- ◆ Plutonium (Pu)
- ◆ Uranium: Heather project
- ◆ Thorium
- ◆ Special tritium compounds
- ◆ Americium-241
- ◆ Other radionuclides

Additional January 2026 WG Questions Concerning Other Sources

- ◆ Radioisotope thermoelectric generator (RTG) end use
- ◆ Pinellas contracts
- ◆ Think tank
- ◆ Permissive action link
- ◆ Worker interviews
- ◆ Size of health physics department
- ◆ Routine leak tests on sealed plutonium



Concerns in APR paper

- ◆ Tritium
- ◆ Plutonium
- ◆ Uranium: Heather project
- ◆ Thorium
- ◆ Special tritium compounds
- ◆ Americium-241
- ◆ Other radionuclides



Tritium

- ◆ The APR paper acknowledges that:
 - Tritium was the primary radionuclide of concern
 - There are adequate tritium monitoring data to bound doses from tritium
- ◆ SC&A concurs with the APR's tritium assessment

Plutonium at Pinellas

- ◆ Pu, in the form of plutonium dioxide, was used as a heat source for RTGs produced in Building 400 1975–1991
- ◆ Los Alamos National Laboratory manufactured the heat sources
 - Made in a sealed, triply encapsulated configuration
 - Shipped to Pinellas for assembly into complete RTGs
 - Heat sources held about 80% Pu-238 and 20% Pu-239 by weight
- ◆ SC&A's interim and supplemental review reports conclude that there is no evidence of plutonium leakage from the heat sources

Plutonium-238: Unexplained shipments claim

- ◆ APR cited two “unaccounted” shipments of Pu-238 from Mound Laboratory, totaling 91.4938 kilograms (kg)
- ◆ Records show this represented Mound's total shipment to *all* customers over two fiscal years, not to Pinellas alone
 - Underlying shipment records don't break out quantities by individual customer
 - APR may have misinterpreted the data
- ◆ Pinellas routinely received and shipped Pu-238 in kilogram quantities as part of normal RTG production

Plutonium: Worker interview claim

- ◆ A former worker described loose Pu-238 powder and a connection to the Cassini space mission
- ◆ No supporting documentation located for either claim
- ◆ Cassini RTG development began in 1991—after Pinellas RTG production had already ended
- ◆ Cassini RTGs were substantially larger than any units Pinellas produced

Plutonium-239: Shipment and activity claim

- ◆ APR asserted Pinellas received nearly 1 kg of unexplained Pu-239 in 1976
- ◆ APR's activity calculation, 20 curies (Ci), used an incorrect specific activity; correct figure is about 62 Ci/kg
- ◆ Sixteen other sites also received Pu-239 from Mound that year—Pinellas was one of many customers
- ◆ Small Pu-239 quantities are consistent with routine calibration-source use, not weapons-related activity

Plutonium: Bioassay anomaly claim

- ◆ APR cited a 1976 bioassay showing Pu-239 above minimum detectable level (MDL) with no accompanying Pu-238
 - MDL is a function of the sensitivity of the measuring process
- ◆ The record that appears in the employee's files shows:
 - Preoperational
 - Lists a zero for Pu-238
 - Did not report Pu-239
- ◆ Summary file from November 1977 lists a positive Pu-239
- ◆ This pattern is inconsistent with RTG-related exposure, where Pu-238 would dominate
- ◆ Original record should receive greater evidentiary weight than the later summary record

Plutonium dose reconstruction

- ◆ The Pinellas WG discussed the inadequacies of the Pu bioassay program and the absence of loose Pu contamination during June 11, 2008, and June 11, 2009, meetings
- ◆ NIOSH agreed, with WG support, to address Pu bioassays on a case-by-case basis using the best available data
- ◆ As of January 2016, NIOSH had not received any claims involving plutonium bioassay results
- ◆ No new information has been identified since that agreement that makes SC&A question that previous assessment

Plutonium-239: Further concerns

- ◆ APR paper questions the credibility of one of the source documents, “first plutonium delivered, no date”:
- ◆ SC&A response:
 - The cited document states that the first receipt of Pu was on January 18, 1957, when a 7-gram Pu-239 source was received to calibrate health physics monitoring equipment and that it was most likely an encapsulated plutonium-beryllium neutron source
 - This is supported by a Pinellas health physics report
- ◆ APR paper also cites a U.S. Department of Energy (DOE) document referring to the General Electric (GE) Temporary Plant conducting RTG work before 1975
- ◆ SC&A response:
 - GE Temporary Plant is not a covered facility under the Energy Employees Occupational Illness Compensation Program Act
 - Documentation shows that the Temporary Plant produced neutron generators, not RTGs

Plutonium in the environment

- ◆ APR paper presents several claims that the appearance of Pu-239 in environmental measurements indicates that Pinellas released Pu-239, which would then imply that there might have been in-plant radiation sources exposing workers that were not adequately accounted for by NIOSH
- ◆ SC&A's report addresses
 - Environmental measurements
 - Fallout
 - Isotopic ratios

Plutonium: Environmental data claim

- ◆ APR reported a water sample result as 2.9 microcuries per milliliter (μCi/mL)
- ◆ Correct value: 2.9×10^{-11} μCi/mL—a difference of 100 billion times
- ◆ Isotopic ratio analysis clearly distinguishes fallout (ratio around 0.036) from RTG material (ratio around 5)
- ◆ All environmental data are consistent with global fallout, not plant releases

Fallout and isotopic ratios

- ◆ SC&A reviewed the literature on worldwide environmental Pu levels, particularly from fallout
- ◆ Small quantities of Pu are always found in the environment, primarily due to neutron capture by uranium-238 in uranium ore, nuclear facility and other accidents, and nuclear weapons testing
- ◆ Nuclear forensics, relying on isotopic analyses, can often distinguish the source of environmental Pu
- ◆ Many studies have resulted in a generally accepted Pu-238 to Pu-239 fallout ratio of about 0.036, which is very different from the mass ratio of about 4 to 5 that would be expected from Pinellas RTG Pu
- ◆ SC&A concludes that there is strong support that the offsite Pu samples are not attributable to the Pinellas Plant

DOE health and mortality studies

- ◆ APR paper includes reference to an Oak Ridge Institute for Science and Education retrospective cohort mortality and morbidity study to determine any correlation between radiation exposures at DOE and contractor sites to the incidence of different cancers
- ◆ SC&A notes:
 - Although Pinellas was included in the early planning list for the study, it was not part of the final group chosen for the analysis
 - This is likely because workers at Pinellas did not receive annual doses above 5 rem, which was the study's focus
 - Whether or not Pinellas was included has no impact on the ability to reconstruct doses for the site

Plutonium: Overall conclusion

- ◆ No plutonium contamination found inside the plant or on completed RTGs
- ◆ No plutonium detected via airborne or stack monitoring
- ◆ Environmental results do not match the RTG isotopic signature
- ◆ Findings reinforce the WG's prior determination: no credible pathway for internal plutonium exposure
- ◆ Independent State of Florida report supports SC&A conclusion:
 - Although Pu-238 was used as part of a product from 1975 to 1990, there is no information suggesting that plutonium was released outside the plant

Uranium: Heather project overview

- ◆ The classified Heather project at Pinellas developed a glass component as part of the tritium gas transfer system in a nuclear weapon
- ◆ This project is not mentioned in any NIOSH Pinellas documents
- ◆ SC&A's 2025 supplemental review report provides more details on the Heather project in view of the feasibility of dose reconstruction

Heather project: Uranium doping claim

- ◆ APR alleged Pinellas workers doped glass with uranium on site, creating an unmonitored exposure
- ◆ Site records confirm the glass arrived pre-doped from an outside supplier
- ◆ Estimated worst-case worker doses were well below DOE annual limits

Thorium claims

- ◆ APR cited a news article suggesting thorium processing occurred at Pinellas
- ◆ Article actually describes a Milwaukee facility; only the thorium-free neutron generator project moved to Pinellas
- ◆ SC&A found only sealed thorium standards and welding-rod use at Pinellas
 - Neither required internal monitoring

Special tritium compounds

- ◆ APR disputed NIOSH's ability to bound doses from special tritium compounds
 - APR cited a Mound Lab document to question whether all incidents involving special tritium compounds at Pinellas were identified and claimed Mound provided health physics support in 1959
- ◆ SC&A found:
 - No evidence that Mound provided health physics support to Pinellas
 - The referenced document pertains to Mound, not Pinellas
 - The contamination occurred at Mound using materials from Pinellas
- ◆ Existing technical basis documents and ORAUT-OTIB-0066, “Calculation of Dose from Intakes of Special Tritium Compounds,” provide established, previously validated methods for these calculations
- ◆ No new evidence identified that undermines those methods

Americium-241 claim

- ◆ APR questioned the basis for classifying a 10 Ci americium-241 source as a sealed americium-beryllium neutron source
- ◆ Site inventory records confirm the source was sealed and used for calibration purposes
- ◆ No evidence the seal was ever breached; external dosimetry would have captured any related external exposure

Other radionuclides

- ◆ APR paper notes that several other radionuclides were listed in the Pinellas inventory: californium (Cf)-252, carbon-14, cobalt-60, cesium-137, krypton-85, and nickel-63
 - APR claims that their details are not provided
- ◆ Except for Cf-252, all these radionuclides have already been discussed in the Pinellas technical basis documents, the SEC, and the SC&A interim review report
- ◆ SC&A found these other radionuclides were not significant sources of radiation exposure

Californium-252 at Pinellas

- ◆ Pinellas operated an Active/Passive Neutron Examination and Assay (APNEA) system in Building 800 that used a strong, stainless-steel encapsulated Cf-252 neutron source
- ◆ The APNEA system was designed to assay waste drums for fissionable material and used smaller, doubly encapsulated neutron sources for onsite simulations, with the full system intended for use at other DOE facilities
- ◆ The main Cf-252 external matrix probe was kept locked in its container when not in use, and the smaller neutron sources were stored in shielded containers within a locked cabinet

Zetatron

- ◆ Pinellas operated a Zetatron neutron generator as part of the Cf-252 APNEA system, a source not fully covered in NIOSH documentation
- ◆ The Zetatron was a compact device that produced 14 mega-electron volt fusion neutrons by accelerating deuterons into a tritium target

Neutron sources: SC&A conclusion

- ◆ Although not part of Pinellas's primary mission, both the APNEA system and the Zetatron were additional neutron sources at Pinellas
- ◆ However, neither introduced radiation exposures beyond those already monitored at the site

January 2026 WG questions about other sources

- ◆ RTG end use
- ◆ Pinellas contracts
- ◆ Think tank
- ◆ Permissive action link
- ◆ Worker interviews
- ◆ Size of health physics department
- ◆ Routine leak tests on sealed plutonium

Did RTG end use affect Pinellas dose reconstruction?

- ◆ Pinellas received encapsulated Pu-238 heat sources, constructed RTG units, and then shipped them to other DOE facilities
- ◆ The documents concerning RTG shipments from Pinellas to other DOE facilities do not indicate their end use
- ◆ The handling and control of the encapsulated heat sources would have been the same for any of the RTGs produced at Pinellas

Did Pinellas contracts affect dose reconstruction?

- ◆ SC&A reviewed the documents in the contracts folders transmitted to the Board by the APR and found that most of the documents were not related to contracts
 - They contained proposals, publications, articles, etc.
- ◆ Some of the documents described the nuclear weapons program and facilities in general, with Pinellas listed as appropriate, but contained no new data applicable to dose reconstruction at Pinellas

Did Pinellas think tank produce new dose reconstruction issues?

- ◆ Pinellas was sometimes used by DOE to develop new concepts and test or modify components of nuclear weapons
 - A WG member referred to it as a “think tank for DOE”
- ◆ SC&A’s research did not reveal any unusual or off-normal contracts or agreements that would suggest activities leading to radiation exposures outside those covered by Pinellas’s radiation protection program

Permissive action link

- ◆ A WG member was concerned about documentation that referenced permissive action link (PAL) systems and implied that their presence combined with alleged bulk Pu indicate that Pinellas made heat sources for PAL systems
- ◆ No credible evidence supports the presence of loose Pu on site
- ◆ PAL systems and power supplies were developed at other DOE sites and installed elsewhere
- ◆ RTGs produced at Pinellas do not affect site radiation protection or dose reconstruction, and PAL-related documentation does not imply heat sources were assembled at Pinellas

Worker interviews

- ◆ A WG member questioned if worker interviews had been conducted for the site and if SC&A had participated
- ◆ SC&A confirms that interviews were conducted with former workers in several venues beginning in 2004 and that some individuals were interviewed multiple times
- ◆ SC&A participated in several of the interviews and reviewed 490 computer-assisted telephone interview reports

Size of health physics department

- ◆ WG members asked about the size of the Pinellas health physics organization and its capacity to adequately monitor radiation exposures
- ◆ The size and structure of the health physics function evolved over the operational history of the plant
 - 1962: Health physics was integrated into a broader industrial health program comprising 13 total personnel
 - 1963 DOE survey: Commended the site for establishing a Committee for Radiation Control, which met monthly to evaluate health physics issues and initiate corrective actions
 - Around 1985: Significant staffing transitions as several health physics staff left
 - 1986 DOE audit: Concluded that management had taken effective steps to strengthen the program

Health physics department: Incident response

- ◆ A WG member was concerned about the availability and responsiveness of the health physics department relating to an incident involving an alpha-radiation alarm in Area 400 where guards had difficulty quickly locating health physics support to verify the area was safe
- ◆ SC&A reviewed the security logs and identified the August 26, 1990, incident:
 - The report indicated that an alpha alarm activated at 18:54 and a health physicist traveled from home to the plant, determined the alarm was false, and silenced it at 20:35
 - The total response time for this after-hours event was 1 hour and 41 minutes
 - Because RTGs contain triply encapsulated Pu and under normal conditions present only an external exposure hazard, it would not be appropriate to expect a health physicist to be on site overnight for what is considered a very low-probability release scenario

Routine leak tests on sealed plutonium

- ◆ A WG member asked if plutonium sealed sources were routinely leak checked
- ◆ The triply encapsulated Pu sources were all checked for contamination using swipe tests upon arrival at Pinellas, which would reveal any leakage
- ◆ It is unclear if additional checks occurred or how long sources were on site prior to being added to an RTG



Overall conclusion

- ◆ SC&A appreciates the APR's continued engagement and the specific, detailed questions raised
- ◆ SC&A investigated every APR claim using primary source documents
- ◆ SC&A found no credible evidence of uncontained plutonium or other unmonitored exposure pathways at Pinellas
- ◆ Data exist to reconstruct worker doses with sufficient accuracy



Next steps

- ◆ SC&A will continue to review any new material submitted by the APR or Work Group
- ◆ Questions?