Department of Energy
Washington, DC 20585

July 29, 2026

Dr. Thomas Mason
Laboratory Director
Triad National Security, LLC
Los Alamos National Laboratory
Bikini Atoll Road SM 30
Los Alamos, New Mexico 87545

NEL-2026-01

Dear Dr. Mason:

The U.S. Department of Energy (DOE) Office of Enforcement has completed an evaluation into a safety incident involving the discovery of plutonium-238 (Pu-238) outside of a special form sealed radioactive source and personnel contamination in TA-03, Building 40 (SM40), at the Los Alamos National Laboratory on May 8, 2024, as reported into the DOE's Noncompliance Tracking System (NTS) under NTS-NA-LAFO-TRIAD-PHYSCOMPLX-2024-0011049, dated November 22, 2024. Based on this evaluation, the Office of Enforcement identified concerns that warrant management attention by Triad National Security, LLC (Triad).

The concerns specifically relate to how performance testing is conducted for miniature radioisotope heater units (mRHUs) containing encapsulated Pu-238 fuel pellets (fueled capsules) at SM40, a nuclear facility classified as below Hazard Category (HC) 3. Triad certified that these fueled capsules meet U.S. Department of Transportation (DOT) special form requirements. DOE-STD-1027-2018 Change Notice 1, *Hazard Categorization of DOE Nuclear Facilities*, allows sealed radioactive sources that meet DOT's special form criteria to be excluded from the facility's radioactive inventory for the purposes of hazard classification if certain conditions are met. Triad used this exclusion to conduct performance testing of the mRHUs, including the fueled capsules, within SM40. On May 8, 2024, after the completion of a performance test, a Triad worker discovered an unexpected graphite-like powder on their glove during mRHU disassembly. The worker scanned their gloves and detected the presence of radioactivity. On May 14, 2024, Triad determined that the affected mRHU and its fueled capsules potentially no longer met special form certification, a condition that if confirmed, would have resulted in exceeding the facility's allowable radioactive inventory.

Although Triad restored the special form certification after an extensive failure analysis determined that the fueled capsule did not actually fail and additional controls were implemented (such as storing the mRHUs in SAVY-4000 containers when not undergoing testing), this event revealed underlying weaknesses in Triad's adherence to DOE-STD-1027 regarding the exclusion of sealed sources from SM40's radioactive

inventory. Specifically, the weaknesses included: (1) the exclusion of fueled capsules from the radioactive source control program, (2) the absence of analysis for the fueled capsules' design working life and controls to mitigate age-related degradation, (3) the lack of procedures placing special attention on leaking sealed radioactive sources (such as the fueled capsules), which could potentially result in a change to the facility's HC if breached; and (4) the lack of analysis within the final hazard categorization to demonstrate that the fueled capsules would maintain integrity during performance testing. Additionally, the Office of Enforcement noted weaknesses in the subsequent causal analysis, which may not fully address the underlying causes and therefore may not be effective in preventing recurrence.

Radioactive Source Control Program

One of the DOE-STD-1027 conditions for excluding sealed sources from a facility's radioactive inventory is to ensure that the facility implements a sealed radioactive source control program to detect when sealed sources have failed. Triad determined that fueled capsules, which are components of assembled Radioisotope Thermal Generators (RTGs), were not subject to the sealed source control program based on the definition of sealed radioactive source in 10 C.F.R. Part 835[1], which identifies that RTGs are not sealed radioactive sources. This created an inconsistency: Triad relied on the fueled capsules meeting sealed radioactive source criteria for hazard categorization purposes while simultaneously excluding the capsules from its sealed radioactive source program on the basis that they were not sealed sources. While the frequent leak checks conducted during movements within SM40 mitigated an immediate safety performance gap, this inconsistency poses a risk of future performance gaps if the fueled capsules remain unmoved for extended periods (e.g., in storage), as the required six-month leak check interval for sealed source control would not be applied.

Aging Management of the Fueled Capsules

Although at the time of the event Triad had performed impact tests of aged fueled capsules, Triad had not fully analyzed the fueled capsule service life to determine when they could be expected to fail. Triad subsequently evaluated the buildup of helium gas within the fueled capsules and estimated they have approximately 15 years of additional service life before the gas buildup may pose a risk to their structural integrity. However, this information (or other potentially age-related degradation mechanisms, such as radiation-induced embrittlement) has not been incorporated into the compliance documentation for the fueled capsules. Consistent with DOE-STD-1027, the analysis defining the service life of the fueled capsules should be documented to minimize uncertainty regarding the existence and extent of age-related degradation.

[1] 10 C.F.R. § 835.2, *Definitions*, identifies in part that "sealed radioactive sources do not include reactor fuel elements, nuclear explosive devices, and radioisotope thermoelectric generators."

Special Attention for Leaking Sealed Sources

DOE-STD-1027 states that facilities that exclude material in sealed radioactive sources from the facility's radioactive inventory need to pay "special attention" to leaking sources that could change the facility HC if breached. Triad's procedures, such as STO-PRO-0494, Revision 7.1, *Response to Exceeding Material Inventory Limits*, dated June 12, 2023, do not address protocols for breached sealed sources at SM40. As a result, Triad did not recognize or respond to a potential breach of the fueled capsules that could have changed the facility hazard categorization for six days.

Sufficient Analysis in Final Hazard Categorization

DOE-STD-1027 recognizes that DOE facilities may impose conditions that exceed the typical design requirements for sealed sources (e.g., DOT special form criteria) and that the final hazard categorization should demonstrate that the sealed sources maintain their integrity during those conditions. As part of activities at SM40, Triad conducts performance testing of components, including the fueled capsules, to ensure that they will function during space flight and withstand launch (vibration), vacuum, and diurnal effects (extreme heat and cold cycles). Space flight conditions are not consistent with those experienced during typical transportation accidents (e.g., fuel fire, traffic speed impact) and are not reasonably bound by them. Triad acknowledges this in STO-FSS-006, *Facility Hazard Categorization Determination for the SM40 Complex*, Revision 3.3, dated January 25, 2026, appendix E, *Additional Testing Information*, which states that "testing performed at SM-40 and the Space Science Lab may be in scenarios beyond the original testing criteria [for DOT special form] but is within the bounds of historical testing and analysis [of the fueled capsules]." However, Triad does not acknowledge this performance gap in the *Treatment of Sealed Sources and Special Forms* section of appendix A, *Facility Hazard Categorization Determination*, which relies on the Triad DOT special form certification without discussing the additional operational stresses that the fueled capsules are required to meet. While appendix A states "additional information on fueled capsules can be found in appendix E, *Additional Testing Information*" it does not make it clear that the additional information is or should be considered part of the safety envelope for the fueled capsules. This approach could lead to performance gaps if the fueled capsules or other sealed sources were excluded from a facility's radioactive inventory based on analysis that did not address actual facility conditions.

Causal Analysis

Triad prepared the Causal Analysis Report, *Potential Contamination During Source Operations*, dated September 23, 2024, to identify the causes of the May 8, 2024, event. However, this analysis is incomplete as it was issued before Triad completed and issued the *Report on the Analysis of Development Miniature Radioisotope Heater Units (mRHU)*, LA-CP-25-20707, dated September 15, 2025, which documented the destructive analysis of the fueled capsules that were involved in the event. Triad did not revise the causal analysis to include the destructive analysis or to explore barrier failures

and contributing factors related to the treatment of the special form sealed source. Because Triad limited the scope and depth of the causal analysis to exclude information about the source of the fueled capsule failure, including the process for certifying the capsules as special form, the resulting corrective actions may be insufficient to fully address the systemic weaknesses that led to this event and prevent recurrence.

The Office of Enforcement has elected to issue this Enforcement Letter to convey concerns regarding Triad's adherence to DOE-STD-1027 (particularly concerning the application of the sealed source exclusion) and the performance of causal analysis. Issuance of this Enforcement Letter reflects DOE's decision not to pursue further enforcement activity against Triad at this time. In coordination with the National Nuclear Security Administration, the Office of Enforcement will continue to monitor Triad's efforts to improve nuclear safety performance.

This letter imposes no requirements on Triad and no response is required. If you have any questions, please contact me, or your staff may contact Mr. Jacob M. Miller, Director, Office of Nuclear Safety Enforcement, at (301) 903-7707.

Sincerely,

Robin M. Keeler
Acting Director
Office of Enforcement
Office of Enterprise Assessments

cc: Tamara Greenwood, Triad National Security, LLC
Theodore Wyka, NA-LA