



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION IV  
1600 EAST LAMAR BOULEVARD  
ARLINGTON, TEXAS 76011-4511

January 26, 2023

EA-22-040

Marci Marot, Radiation Safety Chair  
U.S. Department of the Interior  
U.S. Geological Survey  
One Denver Federal Center  
Building 810, ENT E-11, MS-205  
Denver, CO 80225

SUBJECT: U.S. GEOLOGICAL SURVEY - NRC INSPECTION REPORT  
030-03728/2021-001, DISPUTED CITED VIOLATION REVISED

Dear Marci Marot:

On April 19, 2022, the U.S. Nuclear Regulatory Commission (NRC) issued Inspection Report 030-03728/2021-001 and Notice of Violation (Notice) to the U.S. Geological Survey (USGS), Agencywide Documents Access and Management System (ADAMS) Accession No. ML22108A242. The inspection report and Notice documented a violation associated with USGS's failure to prepare and submit an annual physical inventory listing report of its special nuclear material that was based on a physical inventory as defined in Title 10 of the *Code of Federal Regulations* (10 CFR) 74.4.

In a letter dated May 12, 2022 (ML22132A247), you provided a written response disputing the violation in Inspection Report 030-03728/2021-001. On May 18, 2022 (ML22138A339), the NRC acknowledged receipt of your letter.

The NRC conducted a detailed review of your May 12, 2022, letter and examined circumstances and applicable regulatory requirements in accordance with Part I, Section 2.8 of the NRC Enforcement Manual. This review included staff who were not involved in the original inspection effort and included a Senior Health Physicist from the Medical and Licensing Assistance Branch from the NRC's Region I office. The details of the NRC's evaluation are contained in the enclosure.

After consideration of the bases for your dispute of the subject report violation, the NRC concluded that the original violation remained valid. However, the staff revised the violation to enhance its clarity and modified the dates of noncompliance. The modified language for the violation is provided in the enclosure. The NRC will reissue Inspection Report 030-03728/2021-001 to revise the Notice.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter, its enclosure, and your response if you choose to provide one will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's ADAMS accessible from the NRC website at <http://www.nrc.gov/reading-rm/adams.html>.

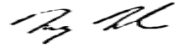
M. Marot

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To the extent possible, your response should not include any personal privacy or proprietary information so that it can be made available to the public without redaction.

If you have any questions concerning this matter, please contact Dr. Lizette Roldán-Otero of my staff at 817-200-1455.

Sincerely,



Signed by Muessle, Mary  
on 01/26/23

Mary C. Muessle, Director  
Radiological Safety and Security Division

Docket No. 030-03728  
License No. 05-01399-08

Enclosure:  
NRC Evaluation of Licensee Response  
to a Notice of Violation

U.S. GEOLOGICAL SURVEY - NRC INSPECTION REPORT 030-03728/2021-001, DISPUTED  
CITED VIOLATION REVISED - DATED JANUARY 26, 2023

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## **NRC Evaluation of Licensee Response to a Notice of Violation**

### **Restatement of the Original Violation:**

On April 19, 2022, the U.S. Nuclear Regulatory Commission (NRC) issued Inspection Report 030-03728/2021-001 and Notice of Violation (Notice) to the U.S. Geological Survey, (USGS) Agencywide Documents Access and Management System (ADAMS) Accession No. ML22108A242. The original violation is restated below:

10 CFR 74.13(a) requires, in part, that the licensee prepare and submit an annual Physical Inventory Listing Report as specified in the instructions in NUREG/BR 0007.

The instructions in NUREG/BR 0007 require, in part, that the licensee use DOE/NRC Form 742C to report a facility's physical inventory listing, as of a specified date.

10 CFR 74.4 defines a physical inventory as a determination on a measured basis of the quantity of special nuclear material on hand at a given time.

Contrary to the above, from March 2009 to March 31, 2021, the licensee failed to prepare and submit Physical Inventory Listing Reports as specified in the instructions in NUREG/BR 0007 when reporting a facility's physical inventory listing, as of a specified date. Specifically, the licensee did not validate its initial determination of the amount of unsealed special nuclear material in a Permit 35 uranium calibration set, for each dated inventory, to determine that changes had not occurred.

### **Licensee Response (Summary)**

The licensee responded to the Notice described above in a letter signed May 12, 2022. The licensee's letter contesting the Notice included six specific contentions which are summarized as follows:

Contention 1: The licensee asserts that the Notice cited regulations that do not require the licensee to perform physical inventories. The licensee instead contends that physical inventories are required by license conditions.

Contention 2: The licensee asserts that the Notice cited the period of noncompliance as 2009 to 2021. However, the licensee contends that information prior to 2018 was not requested by the inspector or presented by the licensee during this inspection. Additionally, multiple inspections have occurred in the period of 2009 through January 2020, without a violation of this inventory requirement. The licensee contends that a preponderance of evidence does not exist to indicate that any Nuclear Materials Management and Safeguards System (NMMSS) reports submitted prior to January 2020, were non-compliant and thus should not be considered for this violation.

Contention 3: The licensee asserts that the regulations cited require a licensee to prepare and submit an annual "Physical Inventory Listing Report" as specified in the instructions in NUREG/BR 0007. The licensee contends that USGS did prepare and submit an annual Physical Inventory Listing Report as specified in the instructions in NUREG/BR-0007 between March 2018 and March 2021.

Enclosure

Contention 4: The licensee asserts that the Notice cited a requirement to use DOE/NRC Form 742C to report a facility's physical inventory listing, as of a specified date. The licensee contends that the licensee did utilize the DOE/NRC Form 742C to report the facility's physical inventory listing for between March 2018 and March 2021.

Contention 5: The licensee asserts that the Notice relies upon the definition of physical inventory in 10 CFR 74.4. 10 CFR 74.4 defines a physical inventory as "a determination on a measured basis of the quantity of special nuclear material on hand at a given time." The licensee contends that between March 2018 and March 2021, the licensee did conduct semi-annual physical inventories to determine on a measured basis the quantity of special nuclear material on hand at a given time. Specifically, the licensee stated that between March 2018 and March 2021, the licensee utilized a combination of physical security, administrative controls, user training, access authorization, visual inspection, volume, mass, activity, concentration and composition of special nuclear material where such determinations were used for special nuclear material control and accounting purposes.

Contention 6: The licensee asserts that the Notice incorrectly states that the licensee did not validate its initial determination of the amount of unsealed special nuclear material in a Permit 35 uranium calibration set, for each dated inventory, to determine that changes had not occurred. The licensee contends that the language used in the "contrary to" portion of the violation does not parallel any language in 10 CFR 74.13(a), NUREG/BR 0007 or 10 CFR 74.4. The licensee further asserts that the word "validate" is not defined in either 10 CFR Part 74 or NUREG/BR-0007.

## **NRC Evaluation of Licensee Response**

Licensee Contentions 1, 3, 4, and 5 all involve requirements to conduct physical inventories of special nuclear material, how those inventories are conducted, and what forms and methods are used to report those inventories.

The complete wording of 10 CFR 74.13(a), the requirement cited in the NRC's April 19, 2022, inspection report, is as follows:

*Each licensee, including nuclear reactor licensees as defined in §§ 50.21 and 50.22 of this chapter, possessing, or who had possessed in the previous reporting period, at any one time and location, special nuclear material in a quantity totaling one gram or more of contained uranium-235, uranium-233, or plutonium shall complete and submit, in computer-readable format Material Balance Reports concerning special nuclear material that the licensee has received, produced, possessed, transferred, consumed, disposed, or lost. This prescribed computer-readable report replaces the DOE/NRC Form 742 which has been previously submitted in paper form. The Physical Inventory Listing Report must be submitted with each Material Balance Report. This prescribed computer-readable report replaces the DOE/NRC Form 742C which has been previously submitted in paper form. Reports must be submitted for each Reporting Identification Symbol (RIS) account including all holding accounts. Each licensee shall prepare and submit the reports described in this paragraph as specified in the instructions in NUREG/BR-0007 and NMMSS Report D-24 "Personal Computer Data Input for NRC Licensees." Copies of these instructions may be obtained from the U.S. Nuclear Regulatory Commission, Division of Fuel Management, Washington, DC 20555-0001, or by e-mail to RidsNmssFc@nrc.gov. Each licensee subject to the requirements*

*of § 74.51 shall compile a report as of March 31 and September 30 of each year and file it within 30 days after the end of the period covered by the report. Licensees subject to the requirements of §§ 74.19(c), 74.31(c)(5), 74.33(c)(4), or 74.43(c)(6) shall submit a report within 60 calendar days of the beginning of the physical inventory. All other licensees shall submit a report no later than March 31 of each year. The Commission may permit a licensee to submit the reports at other times for good cause. Each licensee required to report material balance, and inventory information, as detailed in this part, shall resolve any discrepancies identified during the report review and reconciliation process within 30 calendar days of notification of a discrepancy identified by NRC.*

The NRC determined that the licensee is required to prepare and submit the reports as described in 10 CFR 74.13(a) because USGS possessed, in the previous reporting period, special nuclear material in a quantity totaling one gram or more of contained uranium-235, uranium-233, or plutonium.

As required by 10 CFR 74.13(a), the licensee shall prepare the report as specified in the instructions in NUREG/BR-0007. NUREG/BR-0007 states that “licensees use DOE/NRC Form 742C<sup>1</sup> to report a facility’s physical inventory listing as of a specified date.” Physical inventory is defined in NUREG/BR-0007 as (emphasis added):

*A **physical determination of the quantity** of nuclear material on hand at a given time. The methods of physical inventory and the **associated measurements** vary depending on the material to be inventoried and the process involved. A book inventory between physical inventory takings can be calculated based on the physical inventory quantity from the prior period together with all subsequent inventory changes associated with the determination of that book inventory. The primary purpose of a physical inventory is to confirm the absence of (or to detect) a loss, theft, or diversion of special nuclear material.*

Further, the instructions in NUREG/BR-007 requires the licensee to report element weights and isotope weights for the subject special nuclear material when preparing the facility’s physical inventory listing as of a specified date (See NUREG/BR-007, Section 2.1).

Similarly, the specific wording of 10 CFR 74.4 defines “physical inventory” as the “determination on a **measured basis of the quantity** of special nuclear material on hand at a given time. The methods of physical inventory and **associated measurements** will vary depending on the material to be inventoried and the process involved” (emphasis added).

The NRC’s independent reviewer interviewed the licensee’s primary Authorized User for Permit 35 and the Radiation Safety Officer. As a result of these interviews, the NRC determined that the licensee was not conducting physical inventories through a physical determination of the quantity of nuclear material on hand at a given time, particularly through measuring the volume, mass, activity, concentration and composition of special nuclear material as previously stated in the licensee’s May 12, 2022 written response. The licensee’s process for conducting semi-annual inventories of the subject special nuclear material prior to the January 2022 measurement was to perform a visual inspection of the materials’ continued presence while crediting the licensee’s regularly conducted reviews of physical security, administrative controls,

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<sup>1</sup> DOE/NRC Form 742C was replaced by “the Physical Inventory Listing Report.”

user training, and access authorization. The values reported in the semi-annual inventories are based on the prior semi-annual inventory's value. The licensee's "Base Activity" and "Base Activity Date" for the subject special nuclear material are unknown; therefore, without the retrieval of historical records, it is unknown when the value had last been determined on a truly measured basis. Additionally, due to the lack of use during the period under review (CY 2018-2021), with the licensee stating the last known use was believed to be in the 1980's, the licensee's claims that the specific concentration, activity, and mass are confirmed as known and accurate through use cannot be confirmed or considered as proper conduct of a physical inventory for this specific period.

As described, the licensee's inventory practices prior to January 2022 most accurately reflect a book inventory wherein the licensee was tracking the inventory difference from one semi-annual inventory to the next. The physical measurement that occurred in January 2022 represented a physical inventory. Therefore, the licensee's reporting in DOE/NRC Form 742C prior to the January 2022 physical inventory did not represent a physical inventory as defined both in 10 CFR 74 and NUREG/BR-0007.

Based on the above, the NRC disagrees with the licensee on Contention 1, 3, and 5, and partially agrees on Contention 4. Specifically, the NRC determined that definitions in NUREG/BR-0007 and 10 CFR 74.4 require the licensee to determine how much special nuclear material is physically present at a given time, not simply to confirm that the special nuclear material is still present. The non-compliance described in the NRC's April 19, 2022, Notice accurately reflects USGS's failure to perform a physical inventory or determination as required by 10 CFR 74.13(a) rather than a book inventory.

For Contention 4, while the NRC does agree that the licensee utilized the proper form (DOE/NRC Form 742C/Physical Inventory Listing Report) for its annual reporting and the NRC also agrees that the licensee submitted the form through "Electronic Data Submission" in accordance with Section 1.3(1) as requested in Section 3.1, "Licensees Reporting under 10 CFR 74.13 or 10 CFR 150.17" of NUREG/BR-0007, the licensee did not actually conduct a physical inventory but rather conducted a book inventory.

Licensee Contention 2 involves the dates of non-compliance cited in the NRC's April 19, 2022, Notice.

The NRC's independent reviewer discussed special nuclear material inventory records with the licensee and found that obtaining inventory records prior to 2018 would require several months to retrieve given their storage location. The NRC's independent review also verified that inventory records prior to 2018 were not reviewed as part of the NRC's 2021-001 inspection. Based on this discovery, the NRC's independent review determined that it would be more appropriate to limit the dates of non-compliance to the period of 2018 or later given that those records were available and reviewed. This change to the period of non-compliance does not alter the severity or validity of the violation cited in Inspection Report 030-03728/2021-001. Additionally, it does not mean that the non-compliance did not exist prior to the timeframe cited. The NRC partially agrees with the licensee on Contention 2.

Licensee Contention 6 involves multiple components associated with the wording in the NRC's April 19, 2022, Notice.

Specifically, the licensee contends that the language used in the "contrary to" portion of the violation does not parallel any language in 10 CFR Part 74.13(a), NUREG/BR 0007 or

10 CFR 74.4. The licensee further asserts that the word “validate” is not defined in either 10 CFR Part 74 or NUREG/BR-0007.

As discussed above, the NRC’s independent reviewer determined the licensee’s actions do not constitute a physical inventory. While the licensee’s actions and controls constituted a book inventory and provided some degree of confidence in the validity of the reporting, the actions taken were administrative in nature and did not confirm the reported values through physical measurements.

Based on that finding, the NRC determined that the violation described in Inspection Report 030-03728/2021-001 is valid and generally adhered to NRC expectations for documenting enforcement actions. However, the NRC staff revised the violation to enhance its clarity, that is, the language used in the “Specifically” statement could have aligned better with the definition of “physical inventory.” Based on the above, the NRC partially agrees with the licensee on Contention 6.

### **Licensee Corrective Action**

As corrective action, the licensee established a new baseline measurement for each of the vials for the physical inventory, allowing the licensee to conduct future physical inventories by comparing of the mass of each vial against the new, baseline values without emptying or opening the vials.

### **NRC Conclusion and Revised Violation**

As a result of the evaluation above, the NRC is revising the Notice in Inspection Report 030-03728/2021-001 as follows:

10 CFR 74.13(a) requires, in part, that the licensee prepare and submit an annual Physical Inventory Listing Report as specified in the instructions in NUREG/BR-0007.

The instructions in NUREG/BR 0007 require, in part, that the licensee use DOE/NRC Form 742C to report a facility’s physical inventory listing, as of a specified date.

10 CFR 74.4 defines a physical inventory as a determination on a measured basis of the quantity of special nuclear material on hand at a given time.

Contrary to the above, from March 31, 2018, to March 31, 2021, the licensee failed to prepare and submit Physical Inventory Listing Reports as specified in the instructions in NUREG/BR-0007 using DOE/NRC Form 742C when reporting a facility’s physical inventory listing, as of a specified date. Specifically, the licensee did not determine on a measured basis the quantity of unsealed special nuclear material in a Permit 35 uranium calibration set, for each dated inventory, to determine that changes had not occurred.