

# NNSA Nuclear Reference Material Program



Reference Material Program News

Fiscal Year 2026 | Issue 1

## NRMP Mission Activities

**Memorandum of Understanding:** At the end of fiscal year (FY) 2025, a Memorandum of Understanding (MOU) was established between NNSA's Office of Stockpile Production Integration (NA-121), Office of International Nuclear Safeguards (NA-241), and Office of Nuclear Forensics (NA-83). The MOU pertains to the management and distribution of nuclear forensic reference materials. NA-83 and NA-241 funds the production of, or otherwise have purview over, reference materials that were prepared to enhance nuclear forensic and nuclear safeguard measurement capabilities. However, NA-121 is the only office with the capability to manage inventories, take orders, or arrange shipping of the reference materials. The MOU formalizes NRMP's role in the management of nuclear forensic materials and establishes requirements for distribution of NNSA's standards.

**Independent Review and Certification:** NRMP revised an Interagency Agreement with the National Institute of Standards and Technology (NIST) to provide the program with assistance in statistical data analysis and to perform independent reviews of certification packages for new or revised reference materials. In FY26, NIST will likely review several reference material projects including CRM U196 HALEU isotope ratio reference material, CRM 150 and 151 uranium radiochronometry reference materials, NFRM Pu-244 plutonium isotope dilution spike, CRM 137A plutonium isotope ratio reference material, and CRM 136A plutonium isotope ratio reference material. If these standards are deemed to meet requirements for certified reference materials, NRMP will issue Certificates of Analysis.

## A Message from the Director

**Program Update:** On October 1<sup>st</sup>, 2025, New Brunswick Laboratory Program Office (NBL PO) officially transitioned to the NNSA Nuclear Reference Material Program (NRMP). The "NBL" Initialism was maintained by the reference material program for many years, even though the lab facilities moved away from New Brunswick, New Jersey in 1977 and laboratory operations ceased in 2016. The change to NRMP was instituted to alleviate confusion about the organization's nature. It also aligns with the program's status and primary mission, which involves developing and providing certified nuclear reference materials for various NNSA missions, the DOE complex in general, and for commercial and research purposes. The full scope of activities performed under the NBL PO moniker is maintained under NRMP.



NRMP's new e-mail address is [NRMPsales@nnsa.doe.gov](mailto:NRMPsales@nnsa.doe.gov) and our new website URL is [www.energy.gov/nnsa/nnsa-nuclear-reference-material-program](http://www.energy.gov/nnsa/nnsa-nuclear-reference-material-program). The "NBLSales" e-mail will continue to function until FY27, but we ask that customers begin to use the new e-mail address to prevent any missed requests or inquiries.

In other news, NRMP is currently evaluating price changes for FY26. The price for reference materials units has not changed since 2014, and handling fees have also been stable since they were instituted in 2016. The cost for operation and maintenance of the reference material program, however, has not remained the same. It is anticipated that both individual unit prices and the handling fees will increase.

If you have questions or need additional information about the name change or anticipated pricing changes, please feel free to contact me at: [richard.essex@nnsa.doe.gov](mailto:richard.essex@nnsa.doe.gov). Likewise, please send any comments, concerns, or complaints to my e-mail. We are always interested in how we can improve.



U.S. DEPARTMENT  
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**NNSA**  
National Nuclear Security Administration

**Plutonium (Pu) Isotopic Standards CRM 136A, CRM 137A and CRM 138A Update:**

Certification packages have been completed for candidate CRMs 136A and 137A, and initial reviews at NIST are in process. Characterization analyses are nearly completed for CRM 138A, which is the last of three updated Pu isotopic standards. The NRMP plans to have certificates issued for CRMs 136A and 137A before the end of FY26. CRMs 136, 137, and 138 were used as the base material for the new Pu isotopic standards. Therefore, NRMP is also planning to issue revised certificates with updated isotopic compositions for the older CRMs.

**Pu Metal CRM 126B Update:** Los Alamos National Laboratory (LANL) prepared over 300 units of the nominally 1-gram Pu metal standard, CRM 126B. Characterization samples selected from these units were transferred to Savannah River National Laboratory (SRNL). SRNL will perform a comprehensive analysis of the material and forward subsamples to Oak Ridge National Laboratory (ORNL) and Lawrence Livermore National Laboratory (LLNL) for isotope composition measurements. Barring any unforeseen complications, characterization analyses for certification of the new plutonium standard will be completed before the end of CY26.

**Neptunium CRM Update:** ORNL purified and converted to oxide a batch neptunium starting material for a new assay and isotopic CRM. Following this preparation work, the samples will be transferred to the Analytical Chemistry Group for the initial characterization measurement and preparation of individual reference material units.

**New Depleted Uranium (DU) Metal CRM Update:** In 2025, Manufacturing Sciences Corporation (MSC) in Oak Ridge, Tennessee began processing a large casting of DU for a new metal isotope composition and assay standard. After observing the condition of the metal and

reviewing acceptance testing analyses performed at ORNL, NRMP decided that there was a significant risk for heterogeneity within the stock metal. Accordingly, the decision was made not to proceed with further processing. NRMP is currently working with Y-12 National Security Complex to identify a new source of high purity DU metal as a starting material for CRM 115A.

**New CRM Initiatives:** This year, the NRMP is developing detailed plans for two important reference material initiatives. One of these projects will produce a new batch of  $^{233}\text{U}$  spike reference material (CRM 111B). Although stocks of the current  $^{233}\text{U}$  spike (CRM 111A) are adequate, this is a popular reference material for measuring the amount fraction of uranium by isotope dilution mass spectrometry. NRMP is starting the development of a replacement CRM so that the new material will be fully certified before stocks of the current CRM are depleted. NRMP has been reaching out to users for input on the form and quantity for a replacement CRM. Based on responses received, a reference material very similar to the CRM 111A is likely (i.e., 5 mg of  $^{233}\text{U}$  as nitrate solution in a glass ampoule).

The second project is the preparation of uranium synthetic calibration mixes for recertification of the "U Series" isotope ratio CRMs and is currently in the planning stages. Highly enriched  $^{235}\text{U}$  and a  $^{238}\text{U}$  endmembers material will be carefully characterized for U assay. The endmembers will be quantitatively mixed to prepare a series of calibration materials with known isotope compositions based on gravimetry. These mixes will, in turn, be used to calibrate high precision mass spectrometric measurements of the U series CRMs resulting in certified uranium isotope ratio values with much smaller uncertainties. Most of the U Series CRMs were certified in the early 1970s, and more precise certified values are needed to calibrate modern mass spectrometers.