



NMMSS News

Nuclear Materials Management & Safeguards System
Published Periodically by & for NMMSS Users

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Mark your Calendar for the NMMSS Annual Training Meeting

The annual Nuclear Materials Management and Safeguards System (NMMSS) training meeting will be held May 15-18, 2017, in Las Vegas, Nevada. The training is planned and organized jointly by the Department of Energy (DOE)/National Nuclear Security Administration (NNSA) and the Nuclear Regulatory Commission (NRC). The 2017 training event also features a guided tour of the Nevada National Security Site (NNSS). **There is no registration fee for this wonderful training opportunity!**

You can register for the training event [HERE](#). We have reserved a limited block of rooms at the rate of \$102.00 per night on a first-come, first-served basis.

If you have difficulty reaching the registration site due to site-specific firewall policies, please contact Alexandra Zeigler at (301) 515-9654. If you have any questions or suggestions, please submit them by email to Pete Dessaulles (DOE/NNSA) at Pete.Dessaules@NNSA.doe.gov or Mirabelle Shoemaker (NRC) at Mirabelle.Shoemaker@NRC.gov.



The four-day training event provides a unique forum for learning and sharing information and experiences associated with a wide range of important topics that affect domestic and international reporting of nuclear materials. The planned agenda includes the following topics:

- Fundamentals of reporting transactions, material balance reports, and inventories;
- Regulatory updates and reporting implications for DOE contractors and NRC licensees;
- Nuclear material reporting issues and practices;
- Industry roundtable discussions;
- Imports and exports of nuclear material;
- Emerging domestic and international developments;
- Nonproliferation;
- Material control and accountability; and
- One-on-one consultation on facility-specific issues.

Who Should Attend? Government and industry professionals responsible for:

- Nuclear materials management,
- Reporting to NMMSS,
- Material control and accountability (MC&A),

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- Nuclear materials issues tracking and corrective actions,
- Nonproliferation and national security,
- Regulatory compliance and licensing, and
- International organizations and foreign government agencies involved in imports and exports of nuclear materials to or from the United States.

Reconciliation of 2016 Inventories for All DOE Sites is Complete!

[DOE O 474.2](#), Change 4, *Nuclear Material Control and Accountability*, requires that DOE sites annually reconcile their facility data after submitting their September 30 inventory. The Order states that reconciliation is to be completed by November 15. The process is as follows:

1. The facility submits its inventory for the period and is provided with the results of processing in NMMSS.
2. Preliminary reports are available upon request from NMMSS for facility use in comparing facility data with NMMSS balances.
3. The data at the facility and reported data in NMMSS are compared. Adjustments are made to the facility books or to NMMSS, as appropriate, regarding balances of material by type, ownership code, and project number (if DOE-owned), and foreign obligations, if applicable.

The 2016 inventories for all DOE sites were successfully reconciled. NMMSS thanks all of the DOE sites for their support and assistance in making this milestone possible.

Please contact Mary McConnell at Mary.McConnell@nnsa.doe.gov or (301) 903-6240 with any questions.

Soliciting Case Studies!

In preparation for the upcoming annual NMMSS training event to be held May 15-18, 2017, in Las Vegas, NV, NRC and DOE are soliciting “case study” scenarios from the entire stakeholder community. The case studies will be presented during several sessions at the NMMSS training event to provide NMMSS users with greater insights and perspectives associated with real-life circumstances that impact the accounting, tracking, and reporting of movements, transfers, and inventories of nuclear materials.

The case studies highlight the congruence of facility-specific business practices and regulatory requirements and examine unique circumstances that necessitated a fresh look at reporting protocols. The solicited topics are intended to be diverse and encompass a broad range of topics, including the reporting of imports and exports, obligations, transactions involving domestic facilities (including between NRC and DOE facilities), licensing, reporting updates or corrections to previously reported transactions, reporting batch names, and accounting for government-owned material.

The facility-specific aspects of the case-studies will remain anonymous, as all case studies are presented as hypothetical scenarios.

Please send any case studies and/or any suggested topics for areas that warrant discussion at the upcoming training event to Mirabelle Shoemaker at Mirabelle.shoemaker@nrc.gov or Pete Dessaulles at pete.dessaules@nnsa.doe.gov. Your input and recommendations will help inform the agenda.

Inventory Reconciliation of NRC Licensees – Helpful Tips for Information!

NRC regulations require licensees to report to NMMSS if they possess one gram or more of special nuclear material (SNM) (plutonium, uranium-233, or uranium-235 contained in enriched uranium) or one kilogram or more of foreign-

obligated source material (natural uranium, depleted uranium, or thorium). Below are some tips to help facilitate a smooth reconciliation. As always, NMMSS analysts are available to provide technical assistance by phone or email.

1. All Government-owned material is reportable per NUREG/BR-0006, Rev. 7, including all SNM, source material, and other materials listed in the Reportable Elements and Isotopes section of the [NMMSS User's Guide](#).
2. For non-government-owned material, licensees are required to submit a Material Balance Report (MBR) or Material Status Report (742 or 742C) when their facilities:
 - Possessed, shipped, or received one gram (≥ 0.5 g) or more of SNM during the reporting period (see the table below); OR
 - Possessed, shipped, or received one kilogram (≥ 0.5 kg) or more of foreign obligated source material (natural uranium, depleted uranium, or thorium – see Table 1 below); OR
 - Imported or exported 1 kg (≥ 0.5 kg) or more of source material.
3. The following reports, which you can request from any NMMSS analyst, may help licensees prepare for reconciliation:
 - M-742A, Material Balance Report by Action Date
 - IA-OBL-05, Obligation Summary Report
 - TJ-045, Transaction Detail for Shipments, Receipts, and Onsite Gains and Losses
4. Fillable Forms 742 and 742C are posted on the NMMSS website – <http://nnsa.energy.gov/about/ourprograms/nuclearsecurity/nmmsshome/nmmssinfo/doenrcforms>. The forms are also posted on the NRC website – <http://www.nrc.gov/reading-rm/doc-collections/forms>.

Material	Material Type	Reporting Unit (rounded up)	Weight that is Reported
Enriched uranium*	20	Whole gram	Element and isotope
Plutonium	50	Whole gram	Element and isotope
Uranium-233	70	Whole gram	Element and isotope
Plutonium-238	83	Tenth of a gram	Element and isotope
Depleted uranium	10	Whole kilogram	Element and isotope
Normal uranium	81	Whole kilogram	Element only
Thorium	88	Whole kilogram	Element only

***Assay Levels of Enriched Uranium (from NUREG/BR-0007, Rev. 6)**

Report enriched uranium by assay level (see below) on separate MBR forms.

- E-1** Greater than normal but less than 5%
- E-2** 5% or more, but less than 20%
- E-3** 20% or more, but less than 80%
- E-4** 80% or more

For any regulatory questions, please contact Mirabelle Shoemaker, NRC NMMSS Project Manager, at 301-415-7363, mirabelle.shoemaker@nrc.gov.



Upcoming DOE NMMSS I Training Course

The DOE NMMSS I (MCA-112) training course is scheduled for **February 7-10, 2017**, at DOE Headquarters in Germantown, MD. This course is designed for personnel who have less than two years of experience in nuclear materials accounting.

The desired class size is 12 or less. A minimum of 6 is required to conduct the class. You may register for the class by contacting Mitch Hembree at (301) 903-6299, or by email at Mitch.Hembree@nnsa.doe.gov, and providing him with your name, nationality, job title, facility name, address, telephone number, and email address. Students must also register for the class with the National Training Center (NTC) at <https://ntc.doe.gov/default.aspx>. There are no training fees for DOE personnel or DOE contractors.

If interested, please contact Mitch Hembree by February 1, 2017.

Upcoming NMMSS Training Course for NRC

NMMSS training for NRC licensees and Federal employees is scheduled for **March 28-30, 2017**, at DOE Headquarters in Germantown, MD. This course is designed for individuals with limited experience in NRC reporting requirements or those who need a refresher. The course content is based on NUREG/BR-0006, Rev. 7 and NUREG/BR-0007, Rev. 6. The following topics, among others, will be included:

- Completion of data forms: transactions, inventory, and material balance;
- Inventory reconciliation;
- Foreign obligations reporting; and
- Report products.

The desired class size is 10 participants or less. A minimum of 6 is required to conduct the class. You may register for the class by contacting Mitch Hembree at (301) 903-6299 or Mitch.Hembree@nnsa.doe.gov and providing your name, nationality, job title, facility name, address, telephone number, and email address. Due to security requirements for entering the DOE Germantown facility, all potential students who are not U.S. citizens MUST register for this workshop at least 45 days prior to the instruction dates. There are no training fees for this course.

If interested, please contact Mitch Hembree by March 20, 2017.

Lessons Learned – AREVA, Inc.

This article was submitted by AREVA, Inc. (AREVA), as a result of commitments made during the Alternative Dispute Resolution (ADR) session between AREVA and the U.S. Nuclear Regulatory Commission (NRC) concerning apparent violations of NRC requirements, as described below.

Background

On September 9, 2015, AREVA met with representatives from the NRC's Office of Nuclear Material Safety and Safeguards (NMSS) wherein licensee responsibilities under the Protocol Additional to the Agreement Between the United States of America and the International Atomic Energy Agency for the Application of Safeguards in the United States of America (hereinafter referred to as the Additional Protocol) were discussed. During the meeting, AREVA officials informed the NMSS representatives that it may have exported reactor components to other countries without making the notifications required by the Additional Protocol and NRC regulations in 10 CFR 110.54(a)(1). AREVA conducted a review of export activities, and later notified the NRC that it had exported zirconium tubes between 2009

and 2015, some of which went to nuclear power plants located in Taiwan, and that it had exported a reactor coolant pump (RCP) to France in July 2014. The RCP export did not include a motor. In October, 2015, AREVA provided the required export notifications to the U.S. Department of Commerce (DOC), and on November 3, 2015, this information was provided to the NRC. NRC staff reviewed the export notifications submitted in November, 2015, and during this review, identified a second apparent violation regarding the export. Reactor primary coolant pumps are described in Paragraph (4) of Appendix A to Part 110 and are therefore not permitted to be exported under the NRC general license in 10 CFR 110.26.

10 CFR 110.54(a)(1) states, in part, that reports of exports of nuclear facilities and equipment shipped during the previous quarter must be made by licensees making exports under the general license or specific license in 10 CFR Part 110 by January 15, April 15, July 15, and October 15 of each year on DOC/NRC Forms AP-M or AP-13, and associated forms. In accordance with 10 CFR 110.54(a)(2), these required reports must be submitted to the DOC, Bureau of Industry and Security. The reports must contain information on all nuclear facilities, equipment, and non-nuclear materials listed in Annex II of the Additional Protocol.

Reactor coolant pumps, reactor pressure tubes, fuel channels, zirconium tubes designed and prepared for use as fuel cladding, and zirconium fuel assembly guide tubes, are nuclear reactor equipment and components equipment described in paragraphs (4) (5), (6) and (7) of Appendix A to 10 CFR Part 110, and are listed in Annex II of the Additional Protocol. As such, AREVA was required by 10 CFR 110.54(a)(1) to submit quarterly reports to the DOC, Bureau of Industry and Security.

On April 21, 2016, the NRC issued a letter to AREVA that detailed the results of NRC's findings and outlined two apparent violations. The apparent violation involved (1) the failure to make quarterly reports of the export of nuclear reactor components subject to the Additional Protocol and as required by NRC's regulations; and (2) the export of a reactor coolant pump (without motor) to France without a specific license authorizing the export.

Lack of Timely Reporting of Nuclear Reactor Component Exports

1.0 Problem Overview & Sequence of Events

AREVA failed to required quarterly reports to the US Nuclear Regulatory Commission (NRC) and US Department of Commerce (DOC) for six shipments that occurred between 2009 and 2015. The quarterly reports were not submitted because AREVA personnel had become unaware of the quarterly reporting requirement. AREVA had become unaware of the quarterly reporting requirement due to the lack of a formalized systematic program and subsequent turnover in key personnel. AREVA failed to implement a formalized systematic program based on an initial incorrect assumption that AP Annex II items subject to quarterly reporting would never be exported by AREVA.

AREVA made the incorrect assumption that Annex II items would never be exported because AREVA personnel: a) only considered normal reactor fuel components; b) Interpreted Annex II and NRC consultations that fuel components were not reportable; and c) assumed that AREVA exports would not change in the future.

2.0 Inappropriate Actions

A. August 2008 – December 2008:

AREVA concluded that quarterly export reports would not be necessary when the AP became effective or in the future. A formalized systematic program for export evaluation and reporting was not created. Written documentation could not be located for that conclusion. However, the AREVA Lynchburg MC&A Safeguards Specialist recalls that the opinion at that time was that reporting was not required based on items historically exported by AREVA. (The AREVA Richland MC&A Safeguards Specialist is not available to comment.)

Failure Mode: Human Error - Misjudgment

Wrong Assumptions: AREVA personnel incorrectly assumed that exports would be limited to fuel reload material and that future exports would not change. They then assumed that a formalized systematic program for evaluation of exports against the Annex II criteria was not necessary.

Misinterpretation of Information: AREVA personnel, at least initially, misinterpreted the Annex II listing. Specifically fuel components were considered to be excluded.

Note: in 2015 while evaluating past exports, AREVA initially interpreted the Annex II 500 KG reporting threshold for zirconium tubes as applying to individual AREVA shipments. Internal NRC review eventually clarified that the threshold is applied at the US level. The Annex II reporting guidance provided in the BIS handbook does not provide this distinction.

Lack of Information Validation or Verification: AREVA personnel were aware that the joint NRC and industry understanding of AP requirements was evolving. AREVA consulted with the NRC in 2008. However, AREVA personnel failed to verify with the NRC that AREVA's and the NRC's initial understanding of the AP quarterly reporting requirements was correct as applied to exports made in 2009 and later years.

B. 2009 – 2015: AREVA did not routinely evaluate potential export reports. AREVA did not issue quarterly AP export reports for fuel channels, cladding, and a reactor coolant pump.

Failure Mode – Organizational & Programmatic

Insufficient Detail: AREVA failed to create a formalized systematic program to evaluate future exports and report as required. In the absence of such a program, the AREVA Lynchburg and Richland fuel facilities, over time, lost awareness of the regulatory requirement. AREVA failed to record or incorporate within its procedures that the Lynchburg and Richland fuel facilities were IAEA selected facilities. The knowledge of this requirement was lost within Richland after personnel changes in the absence of any formal program.

Inadequate Program Monitoring or Management: AREVA failed to monitor compliance of 10.CFR.110 by not questioning how 110.54(a)(1) applied to AREVA and how it was supported.

Inadequate Interface among Organizations: The AREVA ECO relied on the AREVA locations and facilities to report any exports. There is no defined process or requirement for how this information is gathered and shared. There is a corporate export policy but it does not specifically address IAEA AP reporting.

3.0 Initial Corrective Actions

Action #1 - October 29, 2015 – Catchup reports for exports from 2009 through to October 2015 were submitted to BIS.

Action #2 – February 2016 – AREVA Richland procedures were created for the submission of AP quarterly export reports and yearly site reports.

4.0 Long-term Preventive Actions

The following preventive action will be performed: Create a corporate policy and implementing procedures that includes 110.54(a)(1) reporting requirements for AREVA locations and facilities that export covered items.

Export of Reactor Coolant Pump without a Specific License

1.0 Problem Overview

In July, 2014, AREVA exported an RCP, which is on Appendix A of Part 110, without a proper export license. The AREVA ECO considered the export to be eligible for a General License under Section 110.26, as it was not a complete RCP. The RCP was lacking a motor. The RCP was not the property of AREVA. It was the property of South Texas Project. AREVA agreed to ship the RCP to an AREVA affiliate in France (Jeumont), for Jeumont to perform repair and refurbishment on the RCP. The RCP export was reported as a General License in the required Section 110.54 (c) annual report for 2014. The RCP export was also reported in Form AP-13 as part of the October, 2015 catch-up process to conform to the Additional Protocol. In March, 2016, in a telephone call between the AREVA ECO and Brooke Smith and Andrea Jones of the NRC, the NRC indicated that it considered the export to have been made without the proper export license. The RCP is expected to return to the U.S. under a proper General Import License.

2.0 Inappropriate Actions

Part 110 was misinterpreted as allowing an RCP, without a motor, to be eligible for export under a General License. The AREVA Legal Department has determined that the applicable contract terms between South Texas Project and AREVA imposed the burden on AREVA to “secure and comply with all permits, licenses and inspections required of [AREVA] in its name which are necessary for proper execution and completion of the work.” The foregoing assumes that AREVA, and not South Texas Project, was required, under applicable law, to obtain the Specific License.

3.0 Initial Corrective Actions

AREVA reviewed the history of its exports over the past ten years to determine whether any other possible licensing violations existed. An additional export, relating to small modular reactor components was discovered and has been reported as required. The AREVA ECO contacted AREVA personnel familiar with the RCP. Personnel from AREVA's Pump and Motor Service Business Unit provided their opinion that the lack of a motor would not be, by itself, sufficient to call an RCP as being incomplete.

4.0 Long-term Preventive Actions

AREVA has in place an Export Control Policy. AREVA personnel complied with that Policy by timely contacting the ECO. AREVA also has a requirement that any proposal that includes an export from the United States shall be sent to the AREVA ECO for review and approval for compliance with applicable export regulations. Again, AREVA personnel complied with that requirement. AREVA is taking a much more open approach regarding the classification of commodities. Any question as to which export agency controls the nuclear-related commodity will be referred to the NRC for classification assistance for those commodities that AREVA is unable to determine the proper classification. AREVA is reviewing its entire export program and intends to create a formal export procedure(s) to complement its existing Export Control Policy. While the current AREVA Export Control Policy requires training, “as needed,” that requirement will be changed to mandatory training for at least the AREVA personnel regularly involved in shipping activities with annual refresher training for such personnel. That training will include AREVA lessons learned. Such initial training was provided in September, 2016 for 291 attendees. Initial training will also be provided for new AREVA personnel.



Available Products to Assist the NMMSS Community

The following products are available to NMMSS users upon request.

- D-2: **DOE Directory of Reporting Identification Symbols (RIS)**. This directory contains a listing of RISs for the DOE sites that NMMSS accepts as valid as of May 2016.
- D-3: **NRC Directory of Reporting Identification Symbols (RIS)**. This directory contains a listing of RISs for the licensed sites that NMMSS accepts as valid as of May 2016.
- D-15: **International Nuclear Facilities**. This directory contains a listing of RISs for nuclear sites located outside of the United States that NMMSS accepts as valid as of May 2016.
- **SAfeguards Management Software (SAMS)**: SAMS is a facility-based version of the NMMSS software maintained by DOE and NRC. Version 8.0, the most recent update of the SAMS software, lets users input data and perform edit checks for transactions, material balance reports, and inventories, and includes an updated Authority Reference File.

Copies of the above items are available free of charge. Please contact any member of the NMMSS staff, or send a request to the NMMSS mailbox (NMMSS@nnsa.doe.gov) if you would like any of the above items sent to you.

NMMSS Website Update

Schedule of Upcoming Training in 2016-2017:

<https://nnsa.energy.gov/sites/default/files/nnsa/inlinefiles/Upcoming%20NMMSS%20Training%202016-2017.pdf>

Transaction/Inventory Due Dates for DOE Sites

Reporting Month	Transaction Due	Inventory Due
January 2017	February 10	February 15
February 2017	March 10	March 15
March 2017	April 10	April 17
April 2017	May 10	May 15
May 2017	June 10	June 15
June 2017	July 10	July 17
July 2017	August 10	August 15

Upcoming 2017 Observed Holidays

Presidents' Day	Monday, February 20, 2017
Memorial Day	Monday, May 29, 2017
Independence Day	Tuesday, July 4, 2017
Labor Day	Monday, September 4, 2017
Columbus Day	Monday, October 9, 2017
Veterans' Day	Friday, November 10, 2017



NMMSS Points of Contact For Nuclear Material Reporting Technical Support and Assistance

Name	Function	Phone	Email Address
Elaine Beacom	International accounting (IAEA and obligations), NMMSS reports	(301) 903-1328	Elaine.Beamon@nnsa.doe.gov
Mitch Hembree	International accounting (IAEA and obligations), NMMSS training	(301) 903-6299	Mitch.Hembree@nnsa.doe.gov
Gary Hirsch	Specialized analysis, IAEA Selected facilities	(301) 903-6870	Gary.Hirsch@nnsa.doe.gov
Mark Huffman	NRC reconciliation, data processing	(301) 903-0236	Mark.Huffman@nnsa.doe.gov
James Lavery	Data processing	(301) 903-0872	James.Lavery@nnsa.doe.gov
Mary McConnell	DOE reconciliation, NRC reconciliation	(301) 903-6240	Mary.McConnell@nnsa.doe.gov
Ali Tabatabai	Issues/suggestions	(301) 515-9654	Ali.Tabatabai@hq.doe.gov

Program Management
Department of Energy
 Peter Dessaulles (301) 903-4525
 Pete.Dessaules@nnsa.doe.gov

Nuclear Regulatory Commission
 Mirabelle Shoemaker (301) 415-7363
 Mirabelle.shoemaker@nrc.gov

International POC
DOE International POC
 Leigh Gunn (301) 903-7431
 Leigh.Gunn@nnsa.doe.gov

NRC International POC
 Santiago Aguilar (301) 415-7918
 Santiago.Aguilar@nrc.gov

Email: NMMSS@nnsa.doe.gov
Unclassified Fax: (301) 903-1998
www.nnsa.energy.gov/nmmss

Unclassified/Overnight Surface Mailing Addresses

Unclassified

Mary McConnell
 NMMSS Program, NA-532/Germantown Bldg.
 U.S. Department of Energy
 1000 Independence Avenue, SW
 Washington, DC 20585-1290

Overnight – Unclassified

Mary McConnell
 Attn: NMMSS Program, NA-532
 U.S. Department of Energy
 19901 Germantown Road
 Germantown, MD 20874-1207

Classified

The NMMSS classified mailing address is available on the Safeguards and Security Information Management System (SSIMS) or by calling a NMMSS analyst. Identify Mary McConnell as the recipient and NA-532 as the organization.

IMPORTANT: The “DO NOT X-RAY” marking does not prevent incoming packages from being sanitized. Please package compact discs (CDs) in cardboard rather than plastic casings. The plastic is heated by the sanitization machine, thereby warping the CD. There is less chance of this occurring if the CD is packaged in cardboard.

For information on transmitting classified data to NMMSS electronically, contact Pete Dessaulles at (301) 903-4525 or Pete.Dessaules@nnsa.doe.gov.

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