

Accuracy Performance Accountability

The Nuclear Materials Management and Safeguards System (NMMSS)

NMMSS

2014

Annual Users Training Meeting

May 12-15, 2014

Denver, Colorado



Nuclear Regulatory Commission Report to the U.S. Congress: High Enriched Uranium

Gary Langlie, Nuclear Regulatory Commission



Background

- American Medical Isotopes Production Act of 2012 (AMIPA) – passed as part of the National Defense Authorization Act for FY13 (NDAA), which was signed into law on January 2, 2013
- AMIPA's primary focus – to improve reliability of domestic medical isotope supplies without using high enriched uranium (HEU)* and to eventually eliminate HEU exports
- Section 3175 of AMIPA – requires the Chairman of the Nuclear Regulatory Commission (NRC), after consulting with other relevant agencies, to submit within one year a report to Congress on the current disposition of exports from the U.S. of HEU used as fuel or targets in a research or test reactor (RTR)

* HEU is defined as uranium enriched to 20% or more in U-235

Section 3175 – Report Details

- For all previous U.S. exports of HEU used as fuel or targets in a research or test reactor (RTR), the NRC reported on:
 - Current location
 - Whether irradiated
 - Whether used for purpose stated in export license
 - If used for an alternate purpose, did NRC approve
 - Year of export and re-import
 - Current physical and chemical form
 - Adequacy of physical security

Report Data

- Best available data from multiple sources
 - NMMSS and export licenses
 - DOE Global Threat Reduction Initiative reports and consultations
 - U.S. interagency bilateral physical protection visit reports
 - Other public and non-public data
- Data regarding HEU exports for use as fuel or targets in a RTR
- NMMSS information cut off date is December 31, 2012; other information may be more or less recent

Report Format

- Public Report
 - Introduction and summary of findings
 - Brief overview of legal and institutional framework governing U.S. exports of HEU
 - Current disposition of U.S. HEU exports
 - HEU record-keeping and data uncertainties
- Non-Public Annex – Country Profiles (C/FGI-M)
 - Dates of exports and imports and intended recipient facilities
 - Relevant inventory information (locations, irradiation status, chemical and physical forms)
 - Information regarding adequacy of physical protection measures

SUMMARY OF REPORT FINDINGS

- HEU exports for RTRs: 22,600 kg to 35 countries and IAEA from 1957 – 2012
- HEU imports back to the U.S.: 7,700 kg
- HEU elimination
 - 4,300 kg down-blended
 - 500 kg lost in waste
 - 2,400 kg burned up in RTRs
- HEU inventories: Approximately 6,000 kg remains in 20 countries

HEU RECORD-KEEPING AND DATA UNCERTAINTIES

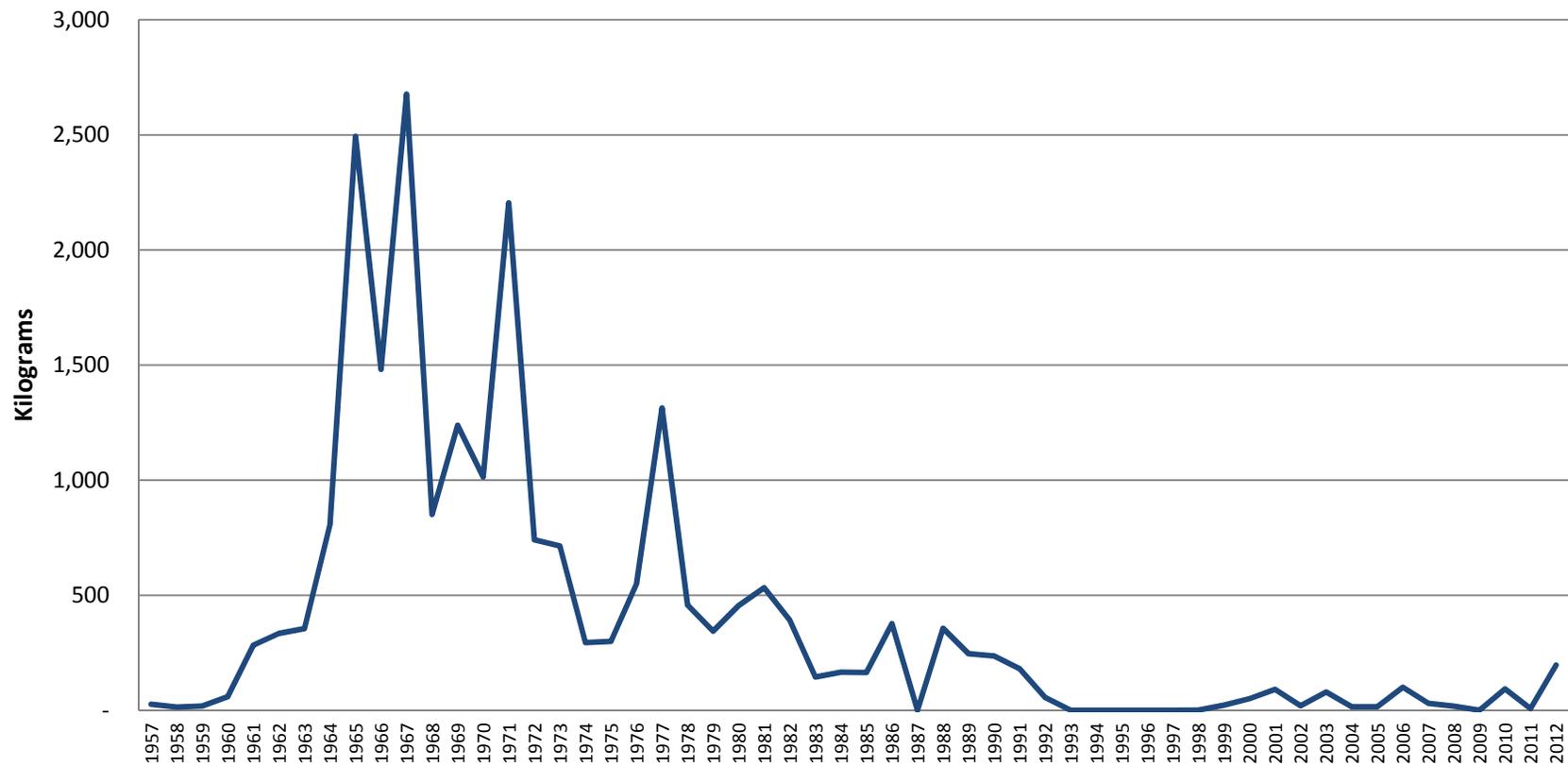
- Primary sources of data uncertainties include
 - HEU transfers (first vs. final destination data)
 - HEU processing and use (losses and waste, reactor burn up, down-blending)
 - Co-mingling of U.S. and non-U.S. HEU
 - Co-mingling of RTR and non-RTR HEU uses
 - National classified information laws
- U.S. Government is engaging foreign partners to reduce the data uncertainties
- The NRC staff has no data to suggest that U.S.-supplied HEU was stolen or diverted

HEU Exports (cont.)

- HEU exports take place within the framework of 123 Agreements for Peaceful Nuclear Cooperation
- Since 1975, the NRC has been responsible for issuing export licenses
- Export licensing involves Executive Branch consultations and requires foreign government assurances
- Presently, HEU is only exported to a limited number of facilities in Europe and Canada, primarily for medical isotope production
- Minimization of civilian uses of HEU remains an important objective of the U.S. Government

HEU Exports

Figure 1: Exports of U.S. HEU 1957 - 2012
used as fuel or targets in a nuclear research or test reactor

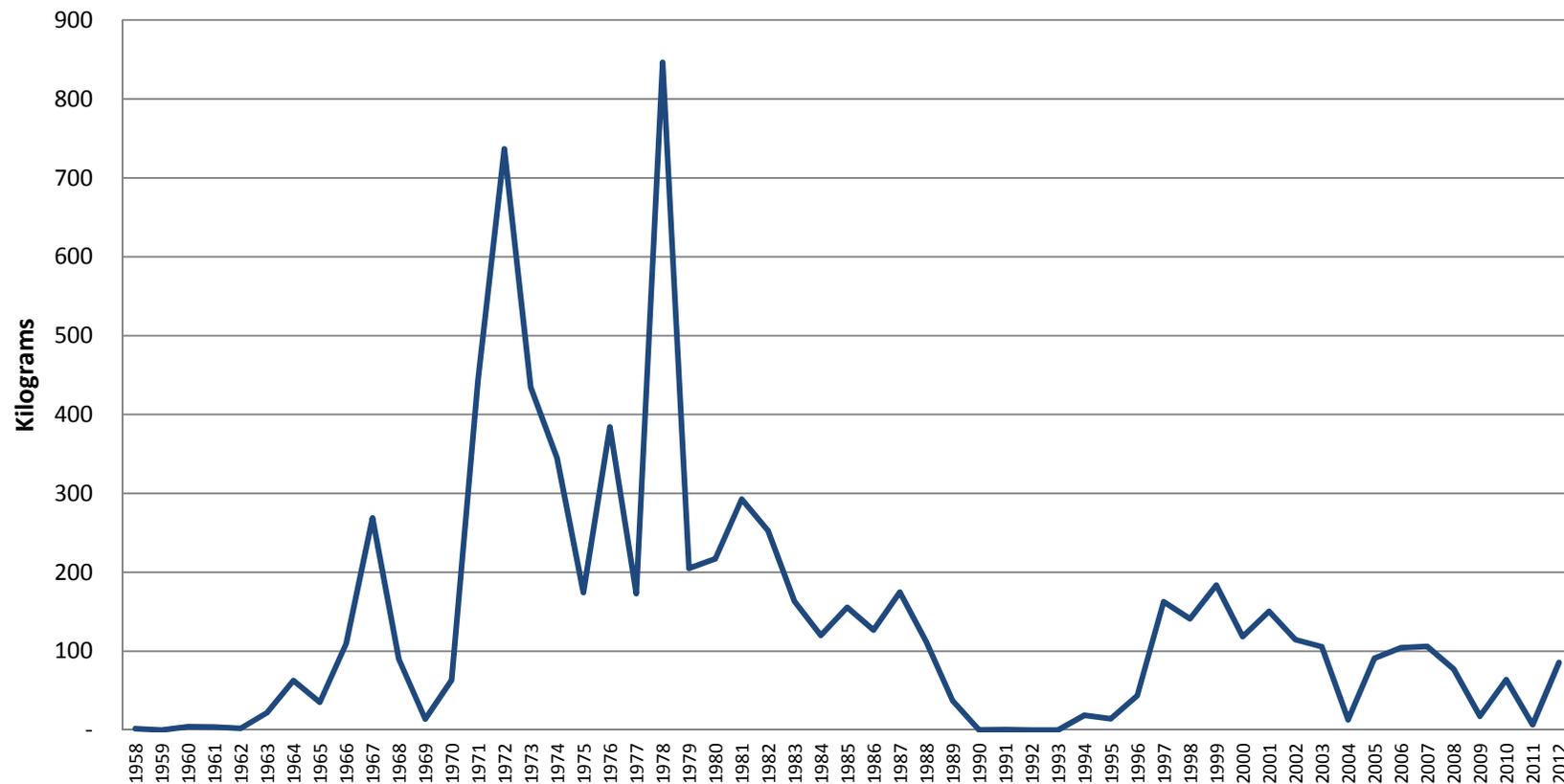


HEU Exports

- HEU exports began in the 1957 time frame following the 1953 Atoms for Peace speech
- 91% of HEU exports occurred before 1990
- Most HEU exported to France, Germany, and Canada

HEU Imports

Figure 2: Imports of U.S. HEU 1958 - 2012
 used as fuel or targets in a nuclear research or test reactor



HEU Imports

- 1964 to ~1988 – foreign spent fuel accepted for storage and chemical processing under the “Off-Site Fuels Policy”
- Nearly 80% of imports occurred prior to 1990
- The returns program resumed in the late 1990s and is currently managed by DOE GTRI.
- Additional HEU will be returned in the future but some HEU is not eligible for return

Remaining HEU Inventory Locations and Status

- Approximately 6,000 kg HEU remains in storage or use at ~ 40 sites in 20 countries
- 15 countries possess > 1 kg of U.S.-origin HEU
- HEU is in a variety of forms (metal, compounds, fresh and irradiated fuel, waste, other forms)
- A large fraction of HEU is irradiated
- Country profile information was presented, in a non-public separate annex, to the U.S. Congress

Adequacy of Physical Protection

- Specific assessments are provided in the non-public annex
- Physical protection measures are assessed against recommendations in INFCIRC/225/Rev. 4 (consistent with current NRC export licensing process)
- Results of U.S. interagency bilateral physical protection visits are the basis for determination in most cases
- In some cases determination is made on a country-wide basis
- Staff is unable to make determination in certain cases
- Staff has no information to suggest that U.S.-supplied HEU was stolen or diverted from a foreign facility

Stated and Alternative Uses

- In most cases, HEU used for purposes stated in export licenses
- Some re-transfers require additional approvals (prior consent) by the U.S. Government and can be processed as license amendments by NRC or “subsequent arrangements” by NNSA
- In a limited number of cases, no additional U.S. approvals were required
- NRC identified 13 requests to use U.S.-supplied HEU for purposes other than what was originally authorized