



# **Use of NMMSS Data in Support of the American Medical Isotopes Production Act of 2012**

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# Background

- Section 3175 of the act requires:
  - Chairman of NRC, after consulting with other relevant agencies, to submit to Congress by January 2, 2014 a report detailing certain U.S. exports of High Enriched Uranium (HEU)\*

\* Uranium enriched to 20% or more in U-235



# Information in report

- “Current” disposition of U.S. exports of HEU used as fuel or targets in research or test reactors and including:
  - **Location of HEU**
    - Whether HEU is irradiated
    - Whether HEU has been used for purpose stated in export license
    - If used for alternate purpose, was it approved by the NRC
  - **Year of export and re-import**
    - Current physical and chemical form
    - Is adequate physical protection being applied to the stored HEU



## Obtaining NMMSS data

- Started by making three special requests of the NMMSS database\*
  - HEU exports from USA
  - HEU imports to USA
  - U.S. HEU transferred between other countries

\* HEU calculated by NMMSS



## NMMSS data interpretation

- NMMSS reports documented all variations of Form-741 reporting:
  - Shipper declaration A-A
  - Receiver declaration A-B
  - Shipper corrections A-C
  - Receiver corrections A-D
  - Project number changes A-M
  - Ownership changes A-M



## **NMMSS data interpretation, cont.**

- Modified special request to document last version of transaction
  - Reduced #741's from ~11,000 to ~4,400
  - A good learning exercise for several NMMSS and NRC staff



## **NRC internal actions**

- Prepare a list of all research and test reactors to which the US has exported HEU
- Questions to answer
  - How to define “test reactor”?
  - Should we include critical assembly in the report?
  - Should we include sub-critical assembly in the report ?



## **NRC Internal actions, cont.**

- How to identify HEU exported for research/test reactors from the list of all HEU exports?
  - Assembled a list of 280 HEU export licenses (AEC and NRC issued)
  - NMMSS prepared a fourth report, based on export licenses
  - Identify HEU exports for other purposes
    - Power reactors                      -48 export licenses
    - Standards                              -General export licenses
    - Fission chambers                      -1 export license & General licenses
    - Lab samples                              -1 export license & General licenses



## **NRC Internal actions, cont.**

- Exports to power reactors in Canada, Germany and Japan were identified:
  - KNK, THTR, AVR, JOYO, FUGEN, Bruce
- General licenses used for most shipments under 100 grams of HEU
  - Standards
  - Fission chambers
  - Lab samples



## **NRC Internal actions, cont.**

- Consider deleting exports, imports, retransfers of less than 100 gram HEU from NMMSS reports
  - Reduces # 741's by over 50%
  - Should have no impact on quantity of HEU exported for research reactor fuel or medical targets
- Obtain and evaluate non-NMMSS data available from DOE
  - DOE's Global Threat Reduction Initiative ?
  - Reduced Enrichment for Research and Test Reactor project ?
- Identify and analyze information gaps



# Observations

- Reporting Identification Symbol (RIS) is basis for NMMSS reporting
- Identified two or three 741's where RIS's appear to be entered into NMMSS in error, XYZ does an A-M to XZY
- A small number of RIS's were de-activated in one country and replaced by new RIS's. Makes following material flow a challenge
- Some 741's document movement to country (3 letter RIS) not a facility (4 letter RIS)



## **NMMSS data**

- Shows that HEU has been exported to and used in approximately 90 research reactors in 35 countries
- Is being used to prepare the year by year summary of the quantity of HEU, used in fuel or medical targets in research or test reactors that was exported and re-imported into the USA



## Status of NRC report

- We are in the process of providing the working group final information from NMMSS documenting:
  - HEU has been exported to and used in approximately 90 research and test reactors in 35 countries,
  - Year by year listing of HEU exports and re-imports to the USA,
  - Transfers of HEU between other countries,
  - Estimates of HEU remaining in other countries.



## Status of NRC report

- The working group will:
  - consult with other government agencies
  - use the NMMSS data, and other available information, to complete the report to Congress