

Accuracy Performance Accountability

The Nuclear Materials Management and Safeguards System (NMMSS)

**NMMSS**

**2014**

Annual Users Training Meeting

May 12-15, 2014

Denver, Colorado



# Challenges Related to Obligations Accounting

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Link Technologies Inc.



# Challenges Related to Obligations Accounting

## Issues that make obligations a challenge

So many obligations, so little time!

Obligations... hmmmmmm?

123 Agreement Communications – what are those?

Why can't Canada just be Canada, and Australia just be Australia?

NMMSS, I'm positive I reported obligations on my 741 correctly...

WHAT! My license will not let me send material to that country!



# Challenges Related to Obligations Accounting

Obligations...  
hmmmmmm?

## Primary Driver Foreign Obligations

- License required to import/export obligated nuclear material
- Foreign obligations = Assurances that material or equipment is transferred pursuant to an Agreement for Peaceful Nuclear Cooperation
- Agreements for Cooperation are necessary, per Section 123 of the Atomic Energy Act of 1954, as amended
- Allow U.S. to trade nuclear material and equipment with foreign countries



# Challenges Related to Obligations Accounting

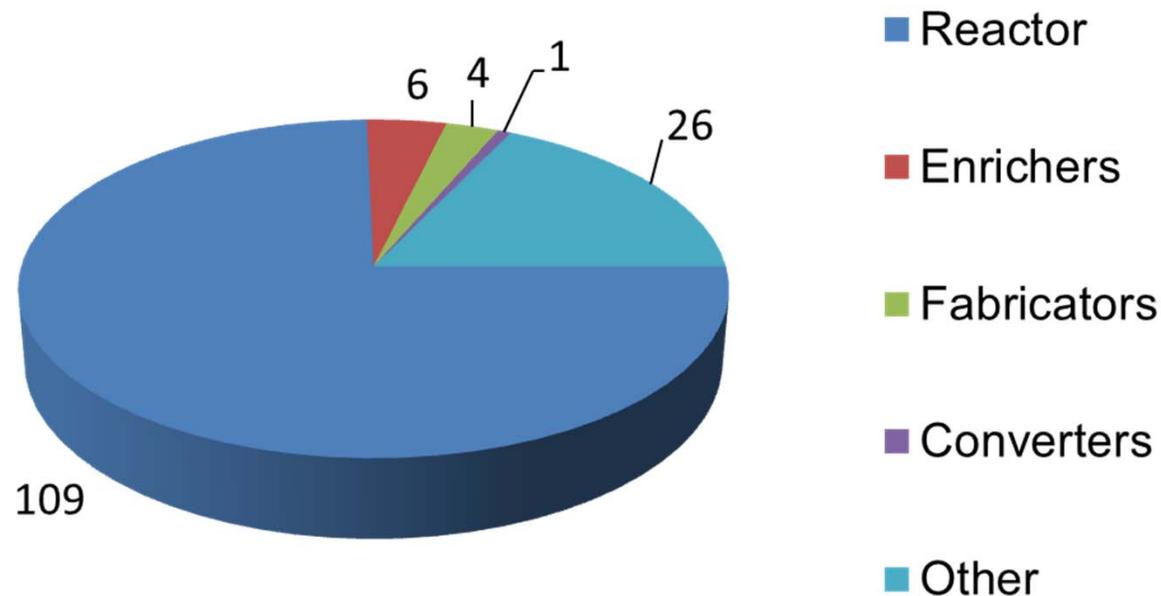
## How are Obligations Associated with Nuclear Material?

- Imports/exports of material
- Nuclear production/on-site increases
- Retransfers
- Nuclear loss/on-site decreases
- Use of Equipment

# Challenges Related to Obligations Accounting

## Number of US Facilities with Obligation Balances Through 2013

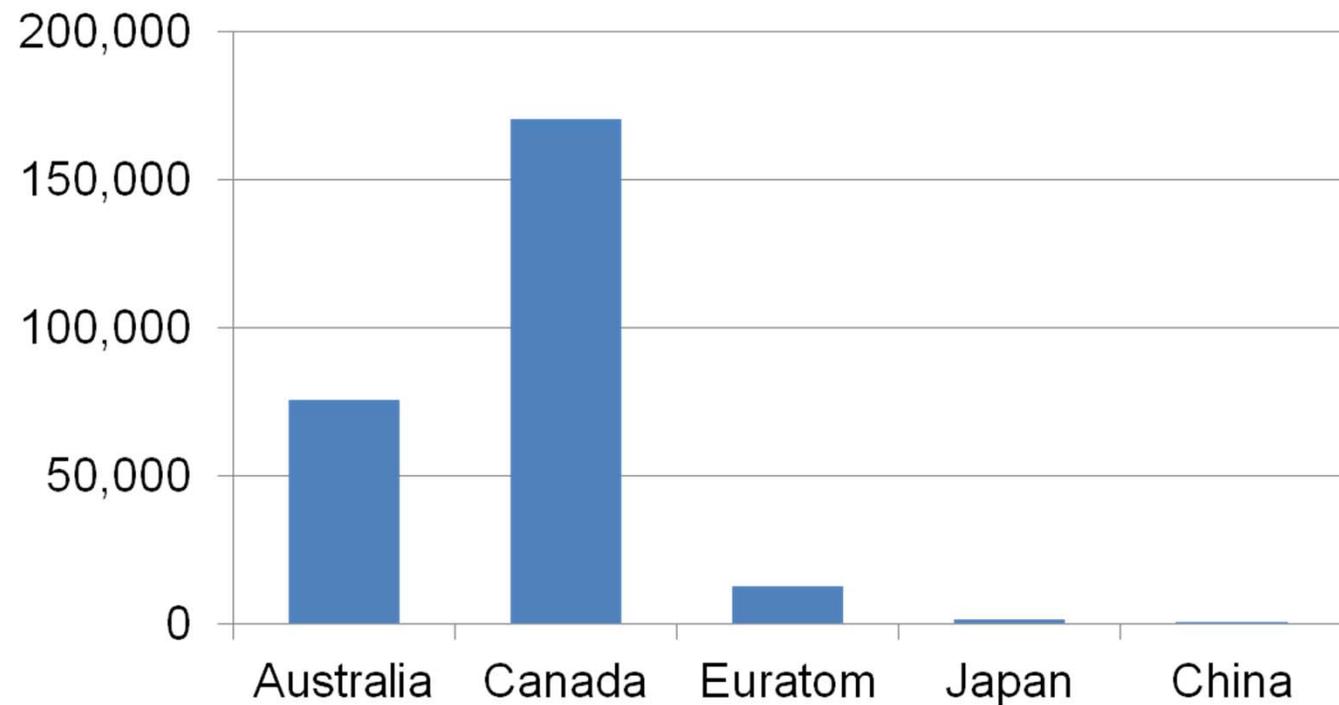
Total US Facilities: 146



# Challenges Related to Obligations Accounting

## Total Obligations (by Entity) in the U.S. through 2013 (Metric Tons)

- Australia
- Canada
- Euratom
- Japan
- China





# Challenges Related to Obligations Accounting

## Uses for Imported/Exported & Obligated Material

- Conversion and enrichment plants
- Enriched uranium to fuel fabrication plants
- Return of spent fuel from foreign research reactors
- Fuel assemblies for foreign reactors
- Nuclear production

# Challenges Related to Obligations Accounting

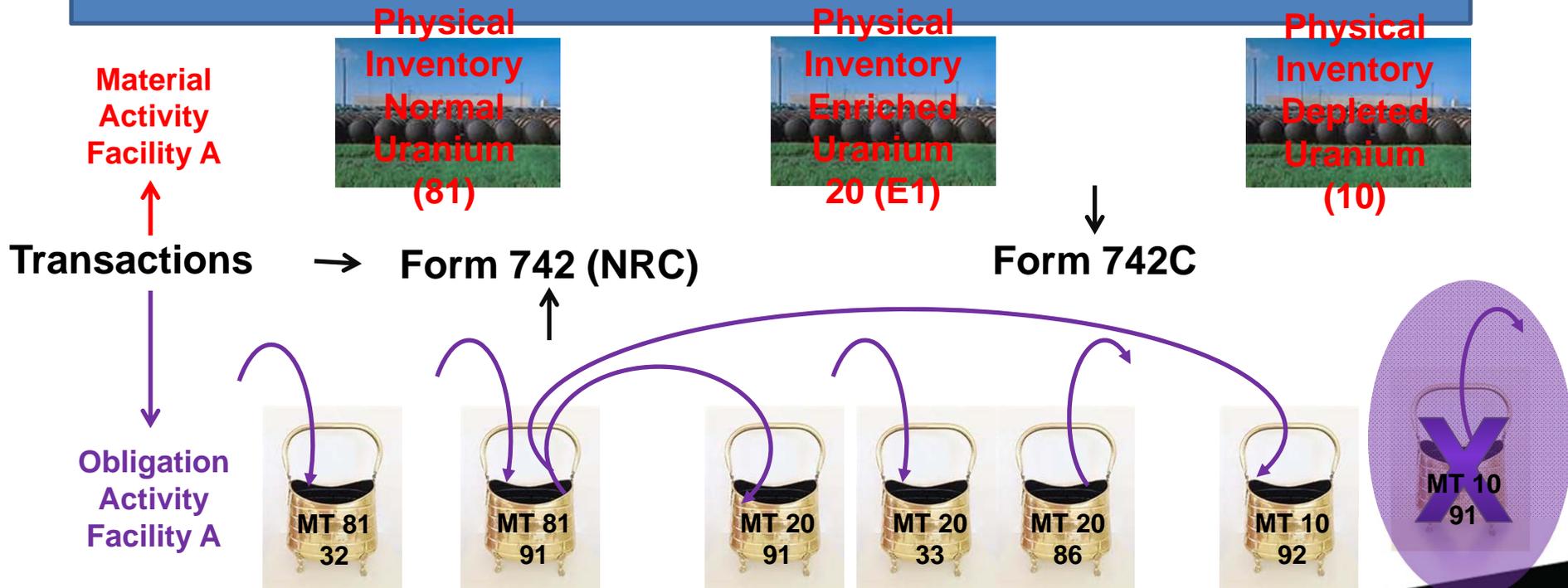
So many obligations, so little time!

- 123 Agreements dictate what obligations are to be tracked
- Facility must dedicate extra time to track obligation balance sheets in addition to typical material movement
- Facility should independently track obligation for each reportable material type
- Obligated material must be tracked across the fuel cycle

# Challenges Related to Obligations Accounting

## Facility Reporting to NMMSS

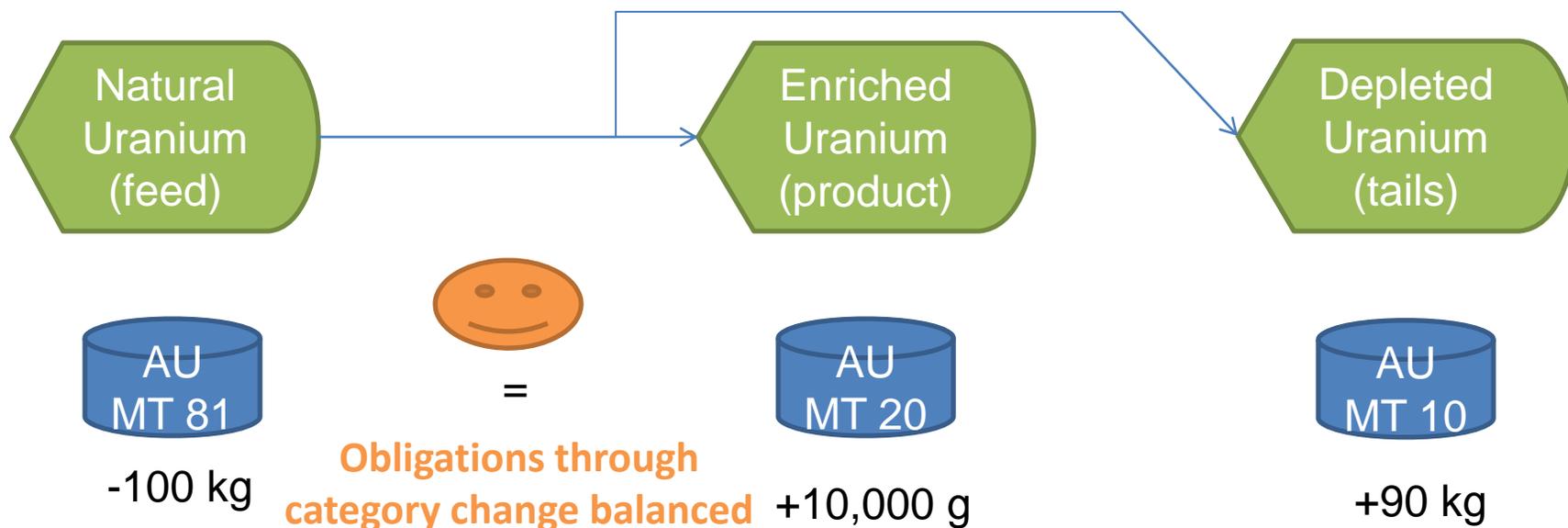
**Example: Facility A and the Obligation Challenge!**



# Challenges Related to Obligations Accounting

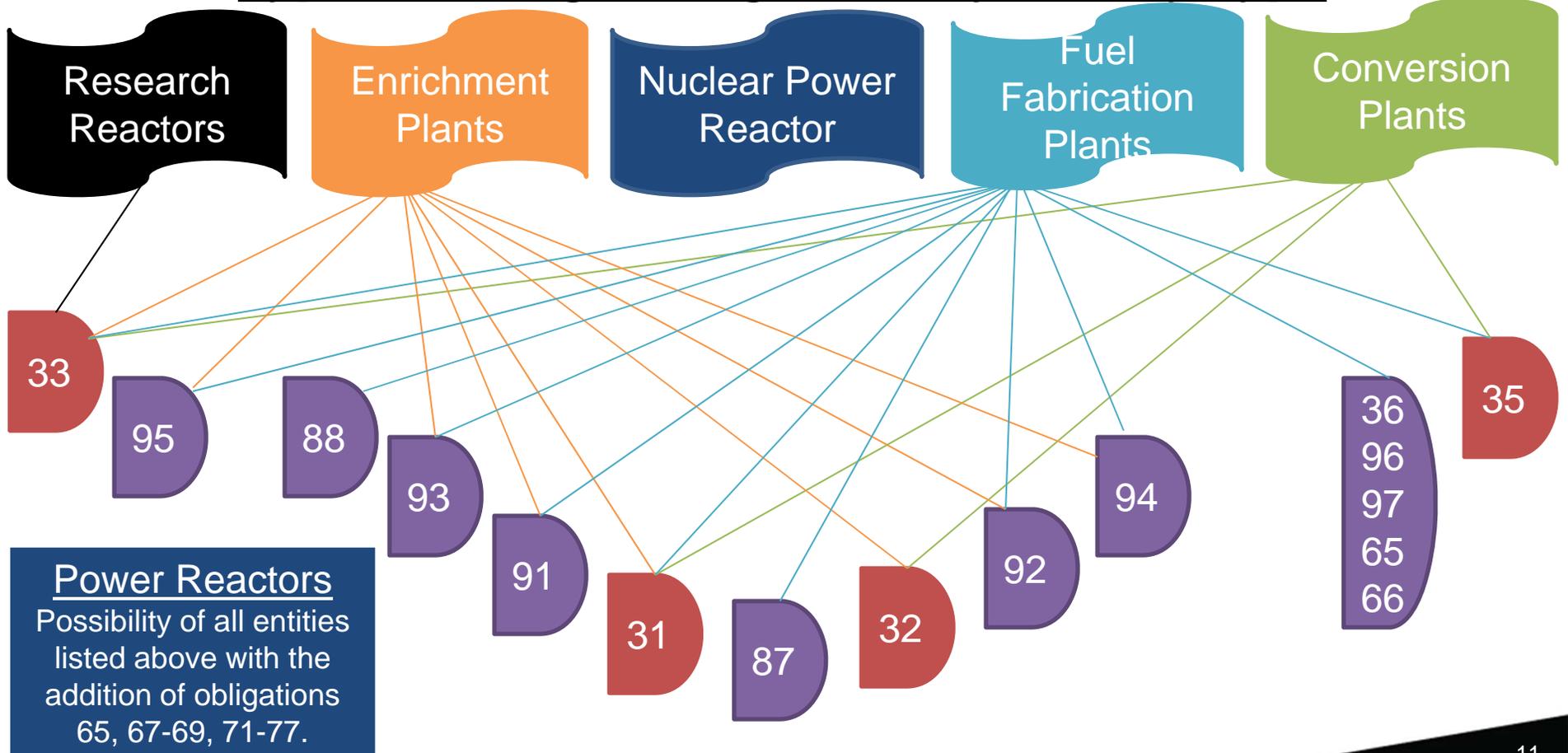
## Obligations Through the Fuel Cycle

**Example:** The Enrichment process and conservation of mass through category change (with regard to obligations)



# Challenges Related to Obligations Accounting

## Typical Foreign Obligations by Facility Type



# Challenges Related to Obligations Accounting

## 123 Agreement Communications – what are those?

- 123 Agreements require reciprocal communications between the entity and agreement partner
- Communications state the intent or actual confirmation of the movement of material / obligations
- Typical types of communications
  - Prior Notification
  - Notice to Industry
  - Confirmation of shipment / receipt

# Challenges Related to Obligations Accounting

## 123 Agreement Communications – what are those? (continued)

- Discrepancies are possible between 123 Agreement communications and shippers invoices or reporting to NMMSS
- There can be differences between initial Agreement Prior Notifications and Agreement Confirmations

# Challenges Related to Obligations Accounting

**Example:** Shipment from Euratom to the U.S. where an obligation changed from initial planning to actual shipment.

### Euratom Prior Notification

- UK Shipper
- US Receiver
- Date of Shipment
- Batch
- Mass: 5,000 g element, 400 g isotope LEU  
20,000 g element NU
- Third Party Obligations: NONE



### Euratom Prior Notification (Acknowledgement)

- UK Shipper
- US Receiver



### U.S. Facility

### UK Facility

Like, Hey  
Um, I've  
some  
stuff....want it.

So sorry! He  
WAS an intern!  
I do have some  
Euratom (33)  
material I  
would like to  
ship to you.



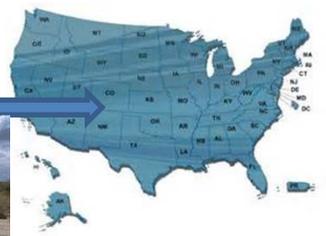
Certainly, I will  
assume  
responsibility  
for your  
material under  
the Euratom  
123  
Agreement..

# Challenges Related to Obligations Accounting

## UK Facility



## U.S. Facility



Submit 741 to NMMSS with Obligations:  
 (LEU) 5,000 g ele. 400 g iso. 33 obl.  
 (NU) 20,000 g ele.

One year later, Australia questions the U.S. regarding the absence of their obligations relating to the UK-US shipment .

**Euratom Confirmation Notification**

- UK Shipper
- US Receiver
- Date of Shipment
- Batch
- Mass: 5,000 g element, 400 g isotope LEU  
20,000 g element NU

Third Party Obligations:  
 2,500 g element, 200 g isotope LEU



Submit 741 CORRECTION to NMMSS with Obligations:  
 -5,000 g ele. -400 g iso. 33 obl.  
 2,500 g ele. 200 g iso. 33 obl.  
 2,500 g ele. 200 g iso. 91 obl.

## U.S. Facility

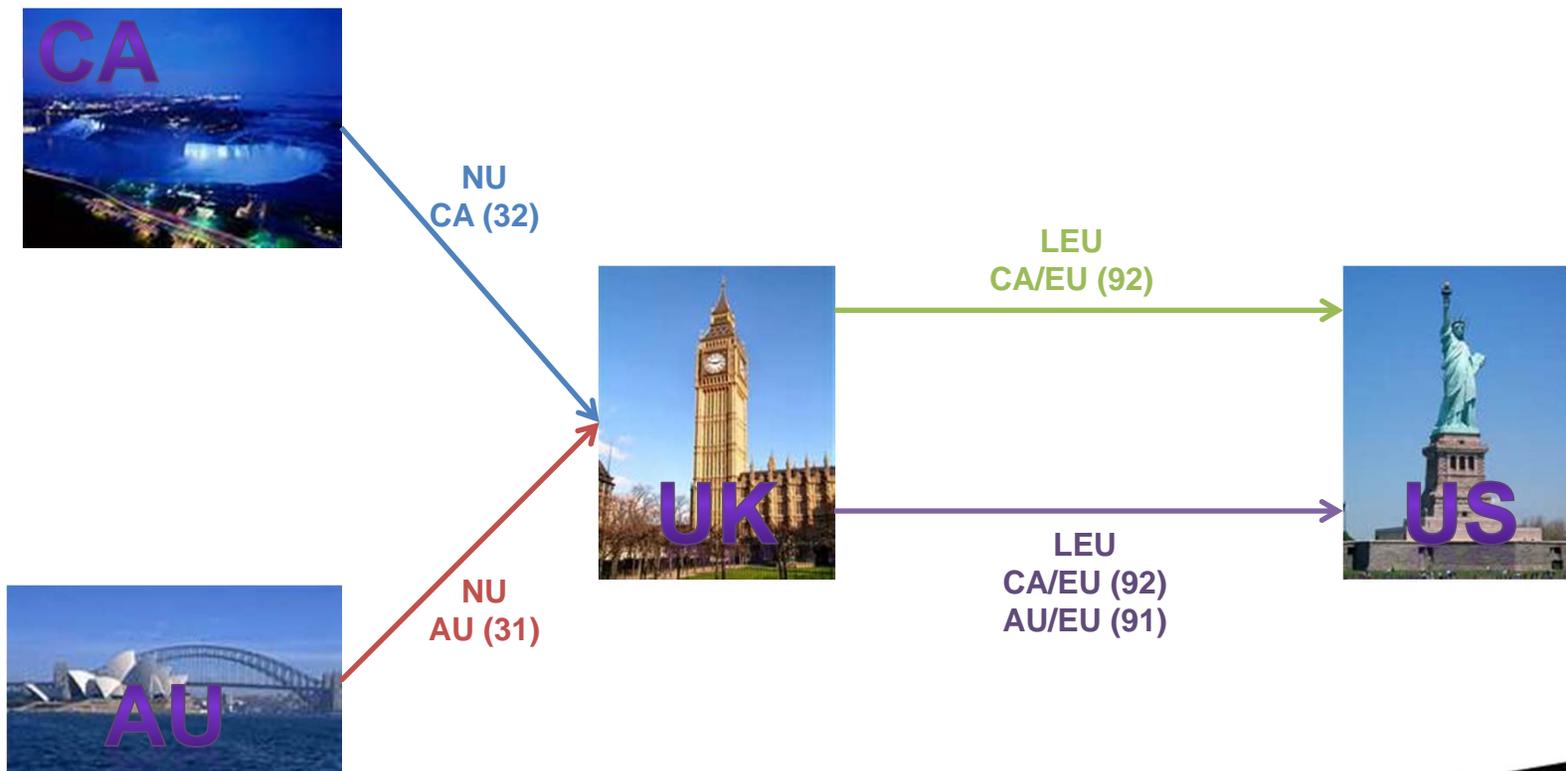
## Challenges Related to Obligations Accounting

Why can't Canada just be  
Canada, and Australia just be  
Australia?

- 123 Agreements involve the U.S. as well as a multitude of other Entities
- For most agreements, material used / processed will acquire a layered obligation (i.e. Australia / Euratom)

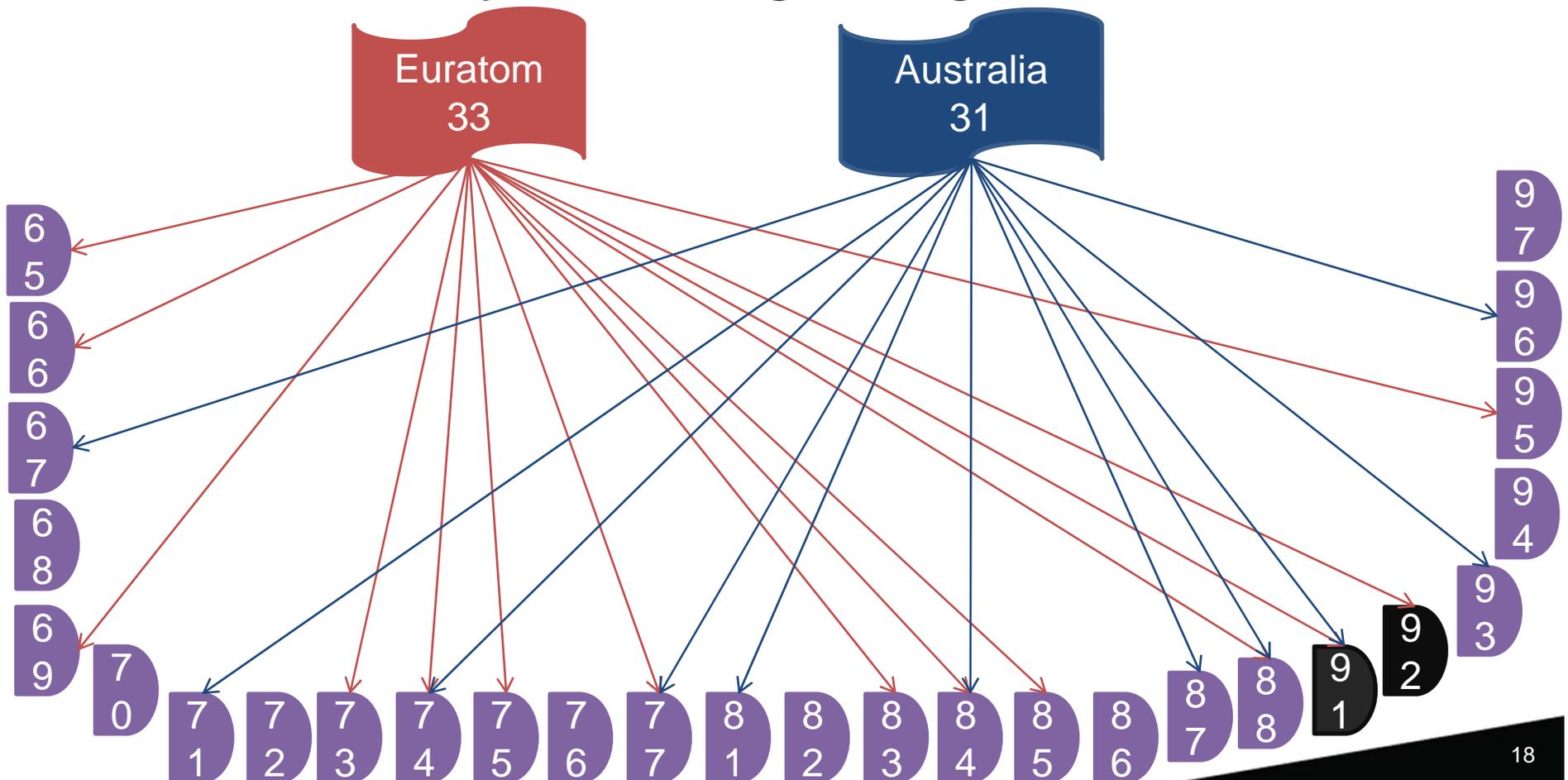
# Challenges Related to Obligations Accounting

## Example: Layering of Obligations



# Challenges Related to Obligations Accounting

## Layered Foreign Obligations





## Challenges Related to Obligations Accounting

WHAT! My license will not let me  
send material to that country!

- What license is required
- Is the license valid
- Are the shipper and receiver valid NMMSS facilities (RIS)
- Is the reporting unit used appropriate for NMMSS reporting
- Is the quantity above NMMSS minimum reporting requirements



# Challenges Related to Obligations Accounting

## Obligated Import/Export Requirements

- Valid license to import/export
- License for import/export has expired
- Satisfy appropriate Agreements for Cooperation guidelines
- License for import/export is invalid for country of origin or receipt
- Send/receive appropriate notifications for associated Agreement for Cooperation
- Report import/export to the NMMSS
- Foreign obligations improperly reported

# Challenges Related to Obligations Accounting

## License???

- General license (**GEN-LIC**) be used as the import license certain cases.
  1. NRC states that except as provided in (2) and (3), a general license is issued to any person to import byproduct, source, or special nuclear material if the U.S. consignee is authorized to receive and possess the material under the relevant NRC or agreement state regulations.
  2. The general license in (1) does not authorize the import of more than 100 kilograms per shipment of source and/or special nuclear material in the form of irradiated fuel.
  3. (1) does not authorize the import under a general license of radioactive waste.

# Challenges Related to Obligations Accounting

## License Issues to Consider

- Is the license active
- Is the import exceeding quantity limits for the license
- Is this license pertinent to shipper and receiver

| IMPORT LICENSE  |  |
|---|--|
| NRC FORM 250<br>(10-07)   | NRC LICENSE NO.: IWAAA<br>NRC DOCKET NO.: 9999001<br>LICENSE EXPIRES: MAY 6, 2015  |
| <b>UNITED STATES OF AMERICA</b><br>Nuclear Regulatory Commission<br>Washington, D.C. 20555  |  |
| Pursuant to the Atomic Energy Act of 1954, as amended, and Title 10, Code of Federal Regulations, Chapter 1, Part 110, a license is issued to authorize the import of nuclear materials and facilities into the United States of America.   |  |
| Reference Documents: Application dated 8/30/2010; Letter dated 10/31/2011; Applicants reference number: IMP-2010-A  |  |
| Reference Documents: Application number: IMP-2010-1   | 010; Letter dated 01/13/2011; Applicant's reference number:  |
| U.S. Import Licensee:   | IGETSTUFF<br>1800 Happy Street<br>Heavenly, CO 99922   |
| Contact:  | Jane Doe   |
| U.S. Receiving Facility:  | IGETSTUFF<br>1800 Happy Street<br>Heavenly, CO 99922   |
| Contact:  | Jane Doe   |
| <b>Quantity and Type:</b> The total quantity of radioactive waste authorized for import shall not exceed 186,000 kilograms of various materials including processed and unprocessed mixed metals, filter cake, spent metal shot, trash, and protective clothing contaminated with a maximum total not to exceed 2,613 kilograms of uranium-235 contained in 58,575 kilograms of uranium over the duration of this license. There will be numerous import shipments, and the specific quantity of U-235 shall not at any time exceed the 350-gram limit specified in the U.S. recipient's domestic possession license. |  |
| Points of Origin:   | IMSPECIAL<br>70 AndIKnowIt Drive<br>Dontspeakenglishtome, France   |
| End Use:  | The contaminated metals and associated secondary wastes are of U.S. origin and are being returned to the United States for management and disposal |
| Authorized for the U.S. Nuclear Regulatory Commission by:   |  |
| Name:   | Signature: _____   |
| Date of Issuance:   | MAY 6, 2011  |
| <b>License Condition:</b> This NRC license authorizes import only. The U.S. licensee, receiving facility, and disposal facility are responsible for complying with any and all additional Federal and State government requirements that apply, including all terms and conditions of their domestic materials licenses.  |  |
| IMPORT LICENSE  |  |

License valid from May 6, 2011 through May 6, 2015

Total not to exceed 2,613 kgs of Uranium-235 contained in 58,575 kgs of uranium...

# Challenges Related to Obligations Accounting

## Export License Issues to Consider

- Is the license active
- Is the export exceeding quantity limits for the license
- Is this license pertinent to shipper

| EXPORT LICENSE   |   |  |                    |                        |                    |                |   |
|--|---|--|--------------------|------------------------|--------------------|----------------|---|
| NRC FORM 250 (10-07)<br><b>UNITED STATES OF AMERICA</b><br>Nuclear Regulatory Commission<br>Washington, D.C. 20555   |   |  |                    |                        |                    |                |   |
| NRC LICENSE NO.: XSOU99999<br>NRC DOCKET NO.: 9999891<br>LICENSE EXPIRES: 3/31/2019  |   |  |                    |                        |                    |                |   |
| Pursuant to the Atomic Energy Act of 1954, as amended, and the Energy Reorganization Act of 1974 and the regulations of the Nuclear Regulatory Commission issued pursuant thereto, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued to the licensee authorizing the export of the materials and/or production or utilization facilities listed below, subject to the terms and conditions herein.   |   |  |                    |                        |                    |                |   |
| LICENSEE<br>Superduper<br>9999 Fantastic Lane<br>Defeated, KY 99933  | ULTIMATE CONSIGNEE(S) IN FOREIGN COUNTRY(IES)<br>See Pages 2 and 3<br><br>(For non-nuclear end uses in recovering tantalum and niobium)         |  |                    |                        |                    |                |   |
| INTERMEDIATE CONSIGNEE(S) IN FOREIGN COUNTRY(IES)<br>NONE  | OTHER U.S. PARTY(IES) TO EXPORT<br>NONE   |  |                    |                        |                    |                |   |
| APPLICANT'S REFERENCE NO. Appl. Dated 10/23/2012   | ULTIMATE DESTINATION: Brazil, Canada, China, Estonia, Germany, Japan, Kazakhstan, and Thailand  |  |                    |                        |                    |                |   |
| <table border="1"> <thead> <tr> <th>QUANTITY</th> <th>DESCRIPTION OF MATERIALS OR FACILITIES</th> </tr> </thead> <tbody> <tr> <td>30,000.0 Kilograms</td> <td>Natural Uranium (U308)</td> </tr> <tr> <td>30,000.0 Kilograms</td> <td>Thorium (ThO2)</td> </tr> </tbody> </table>   | QUANTITY  | DESCRIPTION OF MATERIALS OR FACILITIES | 30,000.0 Kilograms | Natural Uranium (U308) | 30,000.0 Kilograms | Thorium (ThO2) | As contaminants contained in 3,000,000.0 Kilograms tantalum and niobium ores. |
| QUANTITY   | DESCRIPTION OF MATERIALS OR FACILITIES  |  |                    |                        |                    |                |   |
| 30,000.0 Kilograms   | Natural Uranium (U308)  |  |                    |                        |                    |                |   |
| 30,000.0 Kilograms   | Thorium (ThO2)  |  |                    |                        |                    |                |   |
| END  |   |  |                    |                        |                    |                |   |
| Neither this license nor any right under this license shall be assigned or otherwise transferred in violation of the provisions of the Atomic Energy Act of 1954, as amended, and the Energy Reorganization Act of 1974.<br><br>This license is subject to the right of recapture or control by Section 108 of the Atomic Energy Act of 1954, as amended, and to all of the other provisions of said Acts, now or hereafter in effect and to all valid rules and regulations of the Nuclear Regulatory Commission. | THIS LICENSE IS INVALID UNLESS SIGNED BELOW BY AUTHORIZED NRC REPRESENTATIVE<br><br>SIGNATURE:<br>NAME AND TITLE:<br>DATE OF ISSUANCE: 1/1/2011 |  |                    |                        |                    |                |   |

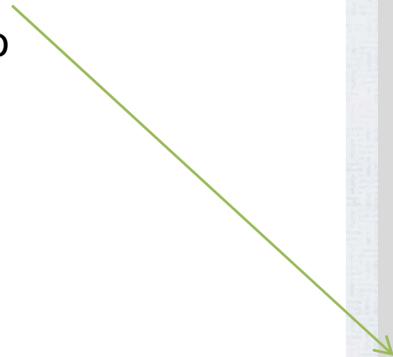
License valid from Jan. 1, 2011 through March 31, 2019

Total for natural uranium and thorium not to exceed 30,000 kgs.

# Challenges Related to Obligations Accounting

## Export License Issues to Consider (continued)

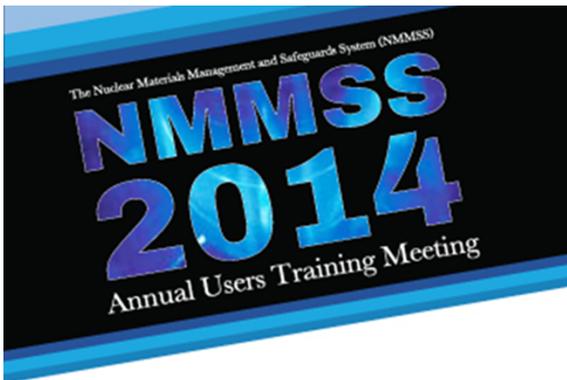
- Is this license pertinent to receiver



XSou99999  
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ULTIMATE CONSIGNEE(S) IN FOREIGN COUNTRY(IES): (Cont'd)

|    |   |
|----|---|
| 1. | Est_Facility<br>No 1243<br>Esttown<br>Estonia             |
| 2. | Braziltowh<br>234 State Street<br>Sao Paulo<br>Brazil     |
| 3. | Chong Metals<br>Shen Town<br>Guanghome<br>Chins           |
| 4. | ChinatownCo<br>ShiShi Town<br>Lion Hill<br>Hunan<br>China |



# Challenges Related to Obligations Accounting

## NRC Export License Types

|   |  |  |  |
|---|--|--|--|
| NRC FORM 280<br>(10-07)   |  | NRC LICENSE NO.: XW012/02<br>Page 1 of 2   |  |
| <b>UNITED STATES OF AMERICA</b><br>Nuclear Regulatory Commission<br>Washington, D.C. 20555  |  | NRC DOCKET NO.: 11005699<br>LICENSE EXPIRES September 30, 2017   |  |
| <small>Pursuant to the Atomic Energy Act of 1954, as amended, and the Energy Reorganization Act of 1974 and the regulations of the Nuclear Regulatory Commission issued pursuant thereto, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued to the licensee authorizing the export of the materials and/or production or utilization facilities listed below, subject to the terms and conditions herein.</small> |  |  |  |
| LICENSEE<br>Perma-Fix Northwest, Inc.<br>2025 Battelle Boulevard<br>Richland, WA 99354<br>Attn: Curt Cannon   |  | ULTIMATE CONSIGNEE(S) IN FOREIGN COUNTRY(IES)<br>See Page 2<br>(For disposition in accordance with Canadian requirements)                  |  |
| INTERMEDIATE CONSIGNEE(S) IN FOREIGN COUNTRY(IES)<br>NONE   |  | OTHER U.S. PARTY(IES) TO EXPORT<br>Perma-Fix Environmental Services, Inc.<br>2800 Solway Road<br>Knoxville, TN 37931<br>Attn: Paul Hickman |  |
| APPLICANT'S REFERENCE NO.: Appl. Dtd. 07/27/12  |  | ULTIMATE DESTINATION: Canada   |  |
| QUANTITY  | DESCRIPTION OF MATERIALS OR FACILITIES<br>Class A radioactive waste consisting of material contaminated with various radionuclides in varying combinations imported from Canada under NRC Import Licenses IW022, IW022/01, and IW022/02. This includes waste which may need to be returned to the Canadian generators (Cameco Fuel Manufacturing and its two subsidiaries in Canada) for disposition. Such waste could include material that could not be recycled for beneficial reuse, or does not conform to specification, and/or has been processed for volume reduction and is directly attributable to processing the material imported under IW022, IW022/01, and IW022/02. The quantity of radioactive waste authorized for export shall be consistent with and not exceed that imported under IW022, IW022/01, and IW022/02. |  |  |
| XW012, Amendment No. 02 continued on Page 2   |  |  |  |
| <small>Neither this license nor any right under this license shall be assigned or otherwise transferred in violation of the provisions of the Atomic Energy Act of 1954, as amended, and the Energy Reorganization Act of 1974.</small>   |  |  |  |
| THIS LICENSE IS INVALID UNLESS SIGNED BELOW BY AUTHORIZED NRC REPRESENTATIVE  |  |  |  |
| SIGNATURE: <i>Margaret M. Doane</i>   |  | NAME AND TITLE: Margaret M. Doane, Director<br>Office of International Programs  |  |
| DATE OF ISSUANCE: October 5, 2012   |  |  |  |

- XSOU** Source Material
- XB** Byproduct Material
- XSNM** Special Nuclear Material
- XW** Waste

Facilities may ship the quantity of specified material up to the authorized quantity.

XW012/02  
Page 2 of 2

ULTIMATE CONSIGNEE(S) IN FOREIGN COUNTRY(IES): (Cont'd)

- Atomic Energy of Canada, Limited  
 Chalk River Laboratories  
 Plant Road  
 Chalk River, Ontario  
 K0J 1J0
- Cameco Corporation  
 Cameco Fuel Manufacturing  
 200 Dorset Street East  
 Port Hope, Ontario  
 Canada L1A 3V4
- Cameco Corporation  
 Port Hope Conversion Facility  
 1 Eldorado Place  
 Port Hope, Ontario  
 Canada L1A 3A1
- Cameco Corporation  
 Blind River Refinery  
 328 Eldorado Road  
 P.O. Box 1539  
 Blind River, Ontario  
 Canada P0R 1B0

(For disposition in accordance with Canadian requirements)

This license is amended to: 1) change the name of Zircotec Precision Industries, Inc., to Cameco Corporation; 2) add two "Ultimate Foreign Consignee(s)" which are both subsidiaries of Cameco Corporation in Canada; 3) add one name to "Other U.S. Party(ies) to Export;" and 4) extend expiration date from August 30, 2012 to September 30, 2017.

All other terms and conditions of this export license remain unchanged.



# Challenges Related to Obligations Accounting

## NMMSS Reporting of Import/Export (741)

- Specify export license number for imports/exports
- Arrangements are handled by an agent who is required to obtain a NRC license to import/export
- The U.S. facility will report both the shipper and receiver 741 documents for imports and exports

# Challenges Related to Obligations Accounting

NMMSS, I'm positive I reported obligations on my 741 correctly...

- Obligation information missing
- Obligation country incorrect
- Obligation material type incorrect
- Obligation quantity incorrect
- Export license should identify authorization for foreign obligated material

# Challenges Related to Obligations Accounting

## NMMSS Reporting Issues with Obligations (continued)

- A valid license is in place to Import or Export material
- NMMSS monitors imports/exports with license
  - Is the license active
  - Are the consignee(s) authorized by the license
  - Is the quantity of material less than or equal to the license quantity limits
  - If material is foreign obligated, does the license authorize import/export
- NRC provides copies of all licenses to NMMSS

# Challenges Related to Obligations Accounting

## Material in Process

- Assignment of obligations to product and tails is on the basis of the proportion of feed.
- NOTE: Equivalence for tails is based on element weight only.

# Challenges Related to Obligations Accounting

## Fungibility

- Uranium from many entities are routinely mixed during processes such as conversion and enrichment
- Uranium is fungible
  - Not possible to physically differentiate uranium origin
  - Proportional assignment of obligations to material inventories
  - Equivalent assignment of obligations to production and losses with facilities

# Challenges Related to Obligations Accounting

REMEMBER that Obligations Accounting is:

Obligation Accountancy

**NOT**

~~Origin Accountancy~~



# Challenges Related to Obligations Accounting

## NMMSS References

- NMMSS reports available (IA-OBL-05)
- Reconciliation of foreign obligations at facilities for improved reporting pursuant to the various Agreements for Cooperation
- NMMSS tracks Agreement notifications relating to Euratom, Canada, Australia, and Japan
- NMMSS will notify facilities if and when
  - New obligation codes are added
  - There is a change involving an Agreement that requires a change in code

# Challenges Related to Obligations Accounting

## Country Reporting: Reports and Implications for DOE Contractors and NRC Licensees

Wednesday  
May 14, 2014  
2:30PM

## Obligations Process and 123 Agreement Communications

Thursday  
May 15, 2014  
9:30AM



The Nuclear Materials Management and Safeguards System (NMMSS)

**NMMSS**  
**2014**  
Annual Users Training Meeting

# Challenges Related to Obligations Accounting

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**Questions?**