

ACCURACY

PERFORMANCE

ACCOUNTABILITY

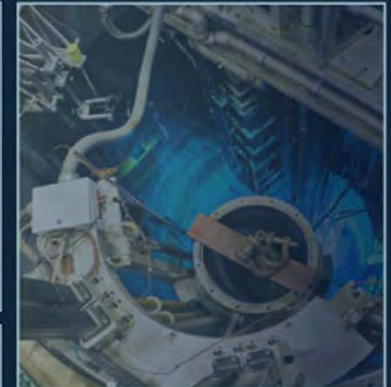


THE NUCLEAR MATERIALS MANAGEMENT AND SAFEGUARDS SYSTEM (NMMSS)

NMMSS 2013

USERS ANNUAL TRAINING MEETING

MAY 20-23, 2013 - ST. LOUIS, MISSOURI



# Obligations Accounting

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NMMSS



# Obligations Accounting

## Goals

- What are foreign obligations
- What is the function of foreign obligations
- Obligation statistics
- NMMSS requirements for obligations
- NMMSS reporting problems commonly experienced



# Obligations Accounting

## Foreign Obligations

- 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



# Obligations Accounting

## Foreign Obligations (continued)

- Items subject to an Agreement are “obligated”
- Material can have multiple obligations
- Safeguard and peaceful use guarantees
  - Official Government to Government notice
  - Facilities are asked to verify material is for peaceful uses and will be made subject to the agreement
  - Assurances must be given prior to ship



# Obligations Accounting

## U.S. Bilateral Agreements for Peaceful Nuclear Cooperation Pursuant to Section 123 of the Atomic Energy Act of 1954, as amended Agreements in Force as of April 2010

- Argentina
- **Australia**
- Bangladesh
- Brazil
- **Canada**
- China
- Colombia
- Egypt
- **European Atomic Energy Community (Euratom)**
- Indonesia
- India
- **International Atomic Energy Agency (IAEA)**
- **Japan**
- Kazakhstan
- Korea, Republic of
- Morocco
- Norway
- Romania
- South Africa
- **Switzerland**
- Taiwan
- Thailand
- Turkey
- Ukraine
- United Arab Emirates





# Obligations Accounting

## Reciprocal Agreements

- Most Agreements are reciprocal in nature: however, the U.S. Government has been required to track nuclear materials and produced nuclear materials from several of these countries: Australia, Canada, Euratom\*, Japan, China, and Switzerland

\*Euratom consists of the following countries: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, and the United Kingdom

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# Obligations Accounting

## NMMSS Obligations History



# Obligations Accounting

## Initial NMMSS approach to Obligations Accounting

- Country Control Number (CCN)
  - Eight character code composed of four sets of two character country/entity/organization codes
  - Used to track foreign material since 1979
- Some deficiencies in the way foreign obligations data was collected and maintained.
  - Governments placing obligations on material that does not fit one of the four sets of codes (i.e. conversion, fabrication, reprocessing, storage)
  - Material that may be obligated by the equipment through which it was processed or produced
- Origin swapping





# Obligations Accounting

## Current NMMSS Obligation Accounting System

- Discontinued CCN as a way to identify obligations on nuclear material
- U.S. facilities were notified of their beginning foreign obligated balances
- Applies to individual transactions as well as periodic material balances
- Changes to NRC regulations (NUREGS)



# Obligations Accounting

## Current System (continued)

- New action codes to show obligations exchanges between facilities as well as removal of WR material at reactors
- Effective for transactions with an action date of 10/1/2003 and later
- 94% of foreign obligations are held at NRC facilities
- Periodic reporting: all activity reported to foreign governments originate from 741 data



# Obligations Accounting

## Obligated Material Types

Type	Domestic Code	Import/Export Code	Reportable Unit of Measurement
Depleted Uranium	10	D	Kilogram Uranium
Enriched Uranium	20	EG	Gram Uranium U-235
Plutonium	50	P	Gram Plutonium
Uranium-233	70	EK	Gram Uranium U-233
Natural Uranium	81	N	Kilogram Uranium
Thorium	88	T	Kilogram Thorium



# Obligations Accounting

## Country Obligation Codes

Code	Country Obligation
<b>31</b>	<b>Australia</b>
<b>32</b>	<b>Canada</b>
<b>33</b>	<b>Euratom</b>
<b>34</b>	<b>Japan</b>
35	People's Republic of China
37	Switzerland
38	Argentina
39	Brazil
40	Chile
81	Australia/Japan

Code	Country Obligation
82	Canada/Japan
83	Euratom/Japan
84	Australia/Euratom/Japan
85	Canada/Euratom/Japan
86	China/Japan
87	Australia/Japan
88	Australia/Canada/Euratom
<b>91</b>	<b>Australia/Euratom</b>
<b>92</b>	<b>Canada/Euratom</b>
WR	Former Soviet Union Weapons Material



# Obligations Accounting

## NMMSS Obligation Activities

- Monthly obligation inventory reports sent to various Agreement Countries
- Annual obligation inventory reports sent to various Agreement entities

**NOTE:** Other than Japan, all country reports are of a similar format based on material type. The Japan report is based on equipment rather than type of material.

Entity	Required	Monthly	Annually
Australia	√	√	√
Canada	√	√	√
Euratom	√	√	√
Japan	√	√	√
Switzerland	√		√
China			√
Chile			√
Brazil			√
Argentina			√





# Obligations Accounting

## New NMMSS Obligation Activities

- Maintain transfer and retransfer information contained in foreign government notifications or other diplomatic documents from U.S. Agreement partners
- Pair foreign government notifications to NMMSS transaction data (transit matching)
- Perform notification follow-up with facilities as necessary based on transit matching activity
- Investigate inquiries from Agreement partners concerning foreign obligated nuclear material



# Obligations Accounting

## NMMSS References

- 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 issue formal notifications to facilities if and when
  - New obligation codes are added
  - There is a change involving an Agreement that requires a change in code
  - Notices to industry



# Obligations Accounting

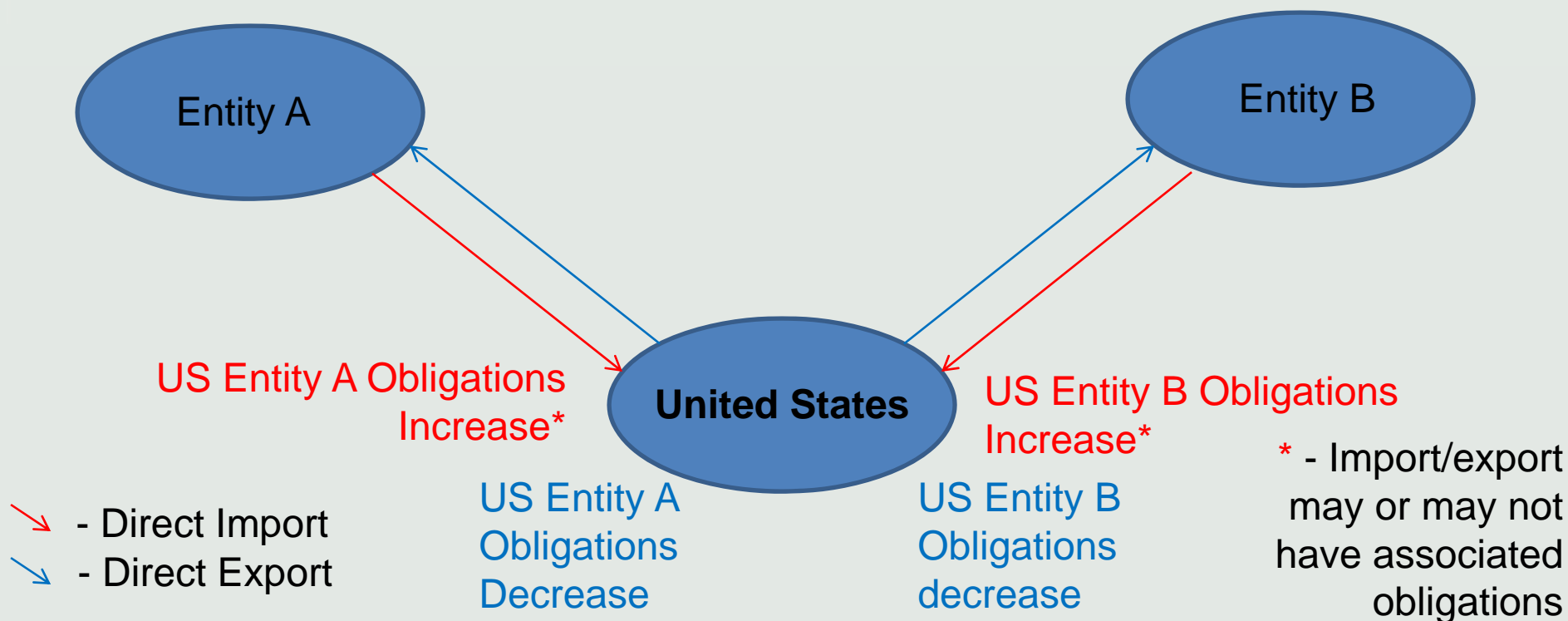
## Conditions that Drive Obligations

- Direct Import
- Direct Export
- Indirect Import
- Indirect Export
- Retransfer
- On-site Increase/Decrease



# Obligations Accounting

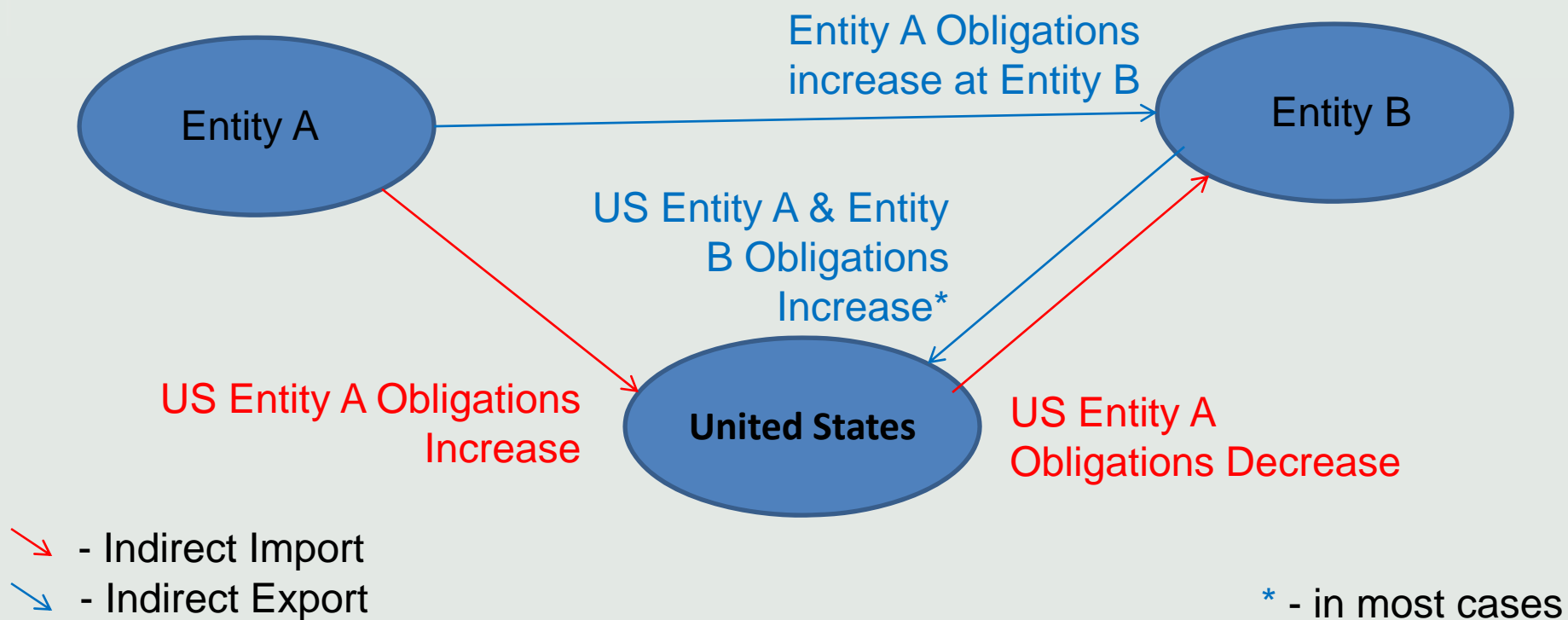
## Direct Import and Export





# Obligations Accounting

## Indirect Import and Export

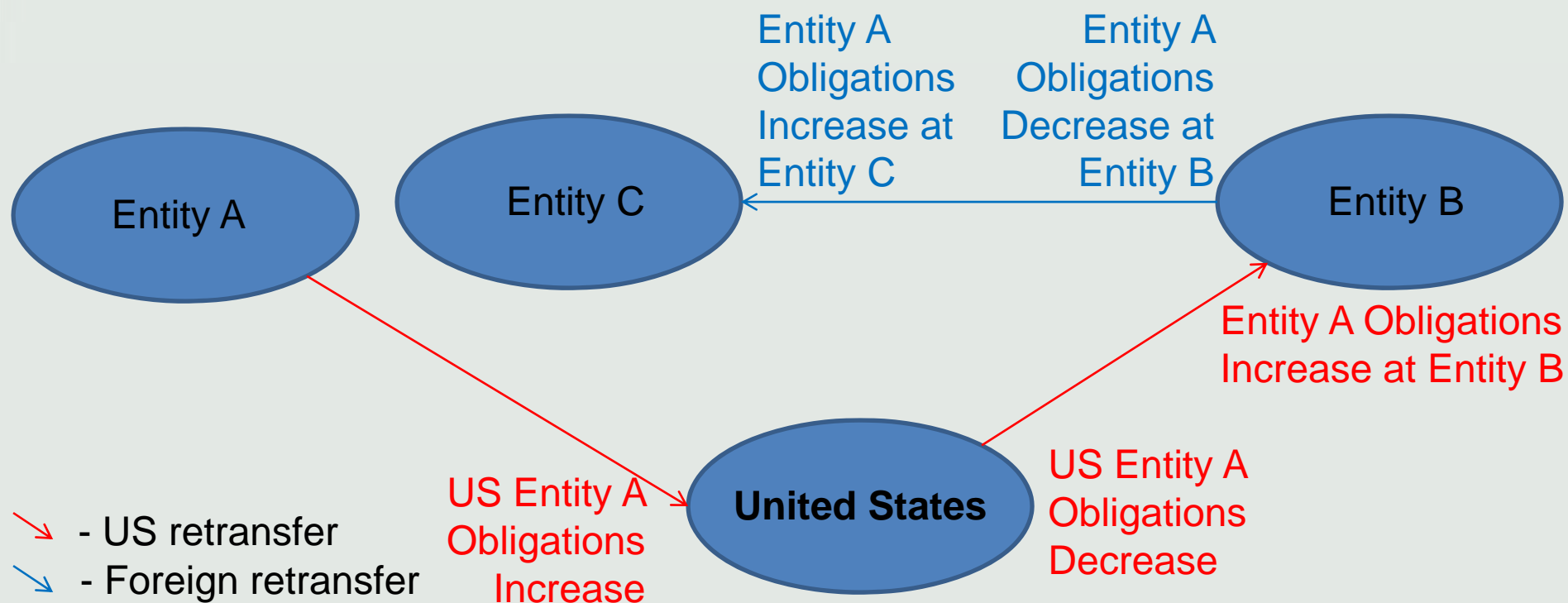






# Obligations Accounting

## Retransfer





# Obligations Accounting

## On-site Increase/Decrease

### Increase

Production

From other  
Materials

### Decrease

Fission &  
Transmutation

Normal  
Operational  
Loss

Rounding  
Bias

Degradation  
to other  
Materials

Decay

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# Obligations Accounting

## Obligation Increases



# Obligations Accounting

## Activities resulting in Obligated Balance Increases

- Import of natural uranium to conversion and enrichment plants
- Import of enriched uranium to fuel fabrication plants
- Fuel assemblies for foreign reactors
- Nuclear production



# Obligations Accounting

## Total Foreign Obligation Increases 2010-2012

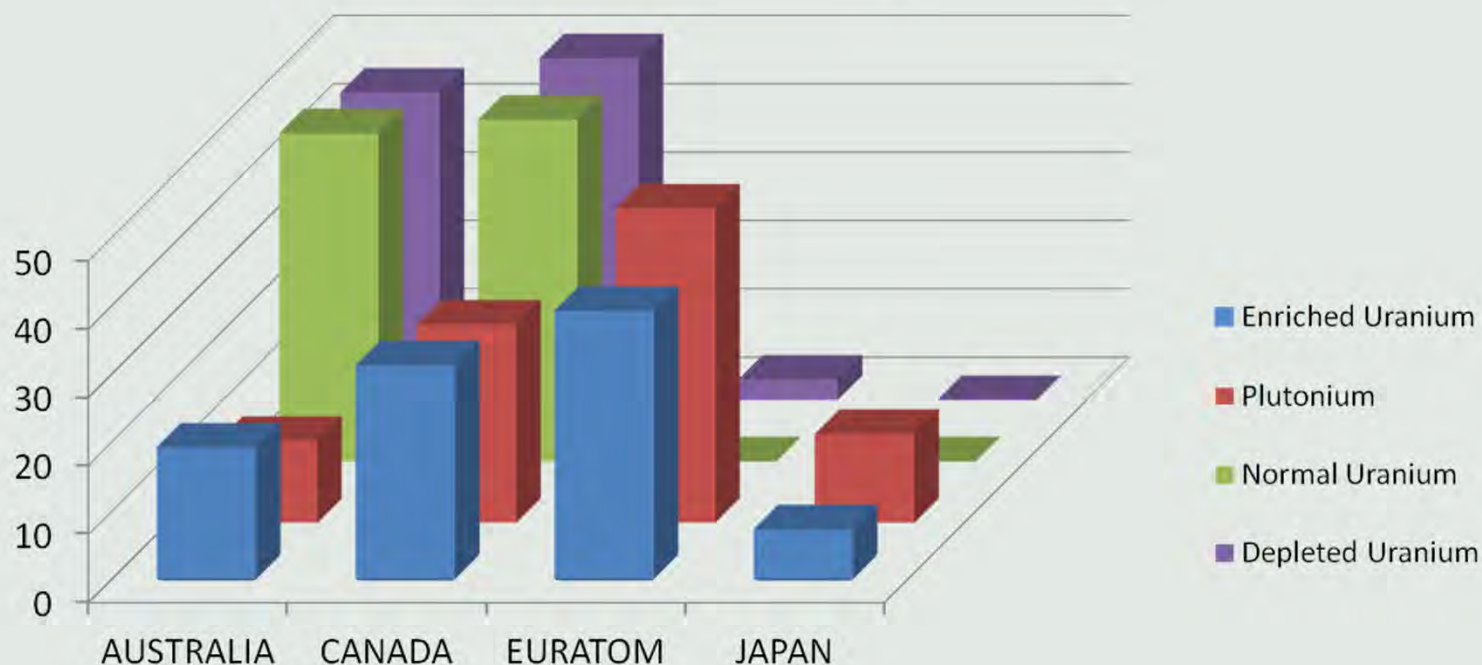
Material	Element Weight	Isotope Weight	Unit
Enriched Uranium	8,901	354	MT
Plutonium	59	-	MT
Normal Uranium	21,955	-	MT
Depleted Uranium	21,386	-	MT





# Obligations Accounting

## Entity Distribution of Foreign Obligation Increases 2010-2012



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# Obligations Accounting

## Obligation Decreases



# Obligations Accounting

## Activities resulting in Obligated Balance Decreases

- Export of natural uranium to conversion and enrichment plants
- Export of enriched uranium to fuel fabrication plants
- Export of fuel assemblies for foreign reactors
- Foreign retransfers
- Nuclear loss



# Obligations Accounting

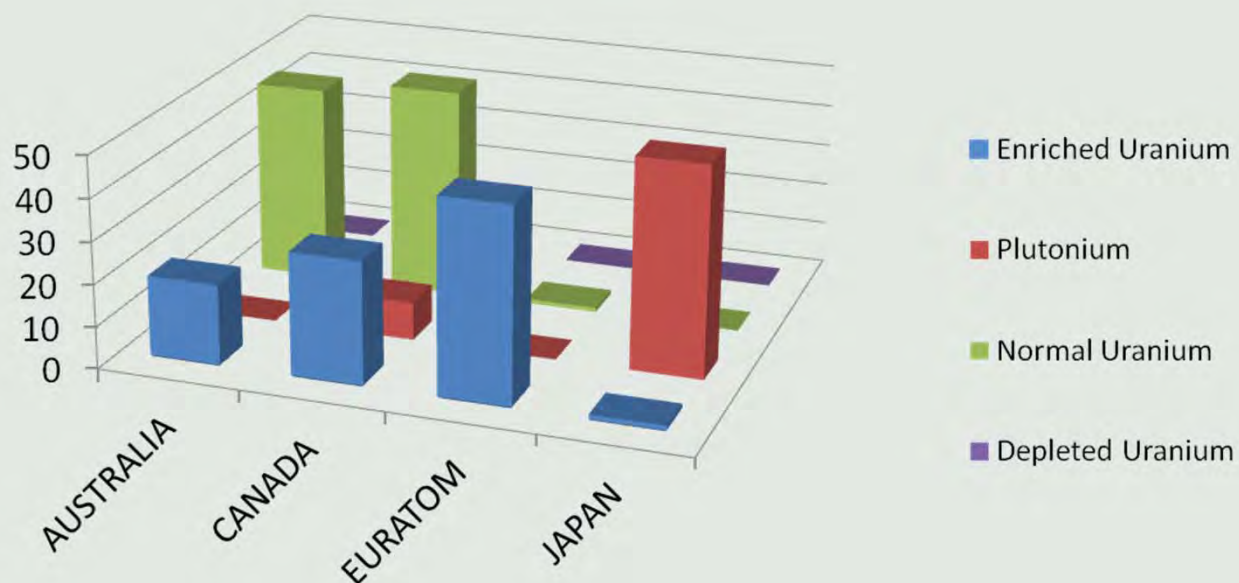
## Total Foreign Obligation Decreases 2010-2012

Material	Element Weight	Isotope Weight	Unit
Enriched Uranium	2,904	282	MT
Plutonium	2	-	Kg
Normal Uranium	28,347	-	MT
Depleted Uranium	26	0	MT



# Obligations Accounting

## Entity Distribution of Foreign Obligation Decreases 2010-2012







# Obligations Accounting

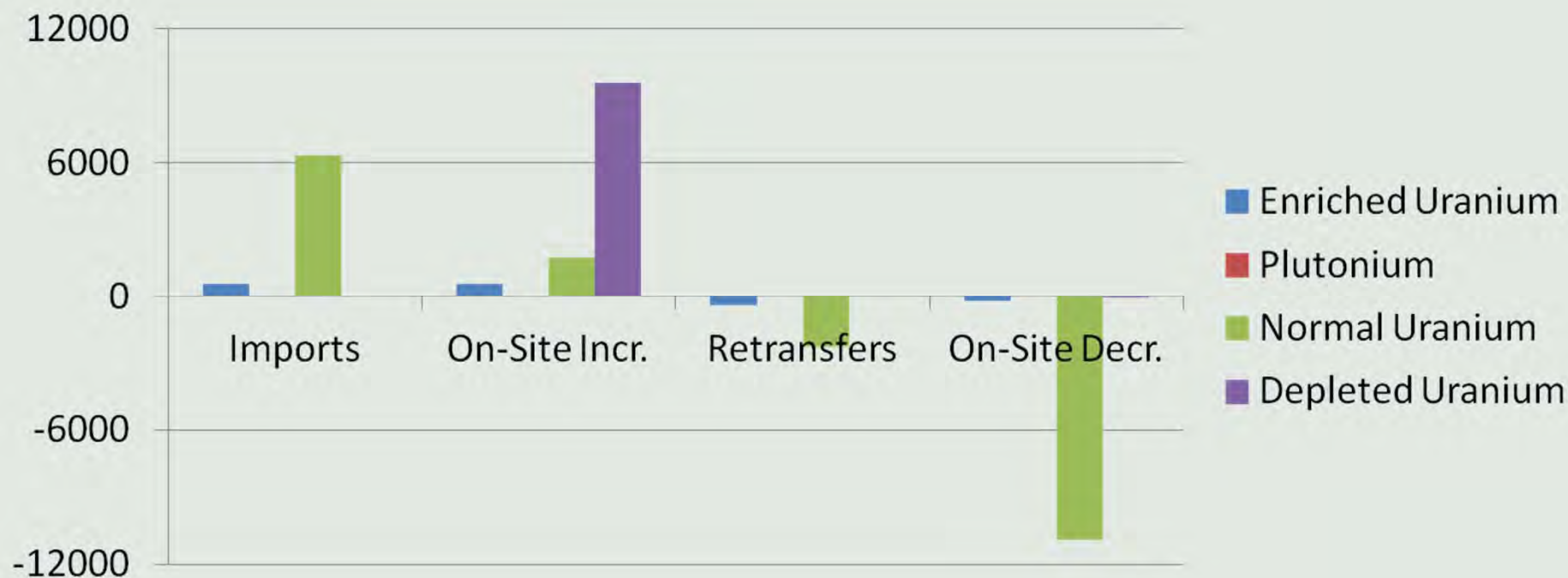
## Total Obligations for Australia December 31, 2012

Material	Element Weight	Isotope Weight	Unit
Enriched Uranium	5,399	89	MT
Plutonium	54	-	MT
Normal Uranium	10,418	-	MT
Depleted Uranium	61,703	-	MT



# Obligations Accounting

## Activity for Australian Obligated Material 2010-2012





# Obligations Accounting

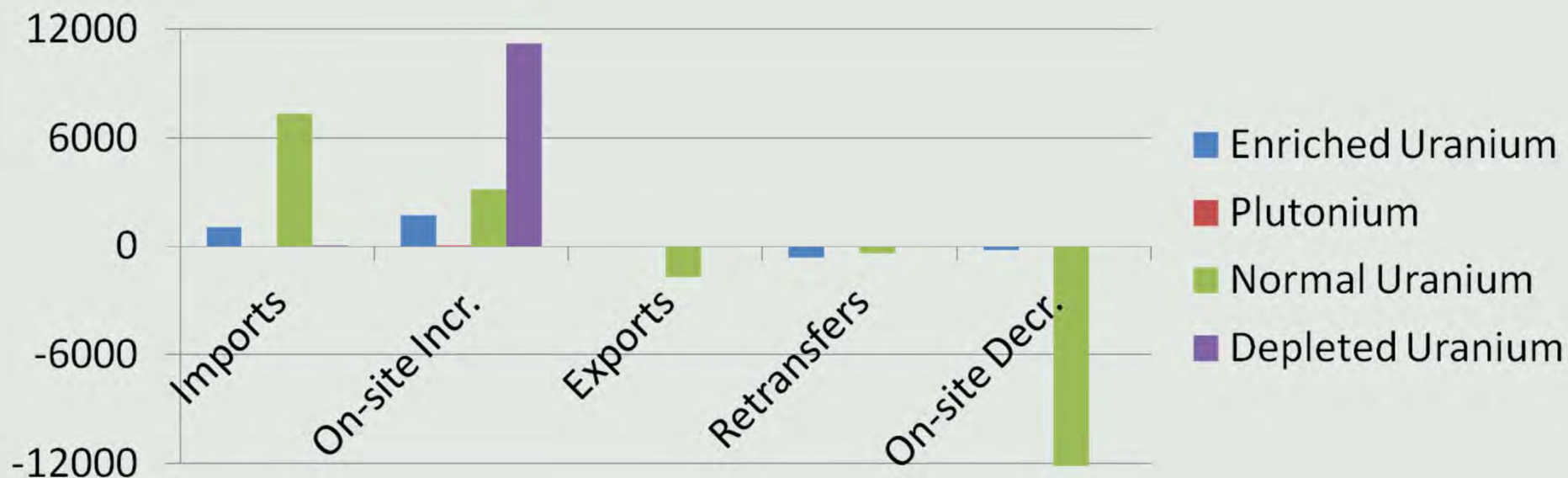
## Total Obligations for Canada December 31, 2012

Material	Element Weight	Isotope Weight	Unit
Enriched Uranium	16,070	227	MT
Plutonium	156	-	MT
Normal Uranium	3,164	-	MT
Depleted Uranium	153,249	-	MT
Thorium	53	-	MT



# Obligations Accounting

## Activity for Canadian Obligated Material 2010-2012





# Obligations Accounting

## Euratom\* Obligations

\*Euratom consists of the following countries: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, **France**, **Germany**, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, **the Netherlands**, Poland, Portugal, Romania, Slovak Republic, Slovenia, **Spain**, **Sweden**, and the **United Kingdom**.



# Obligations Accounting

## Total Obligations for Euratom December 31, 2012

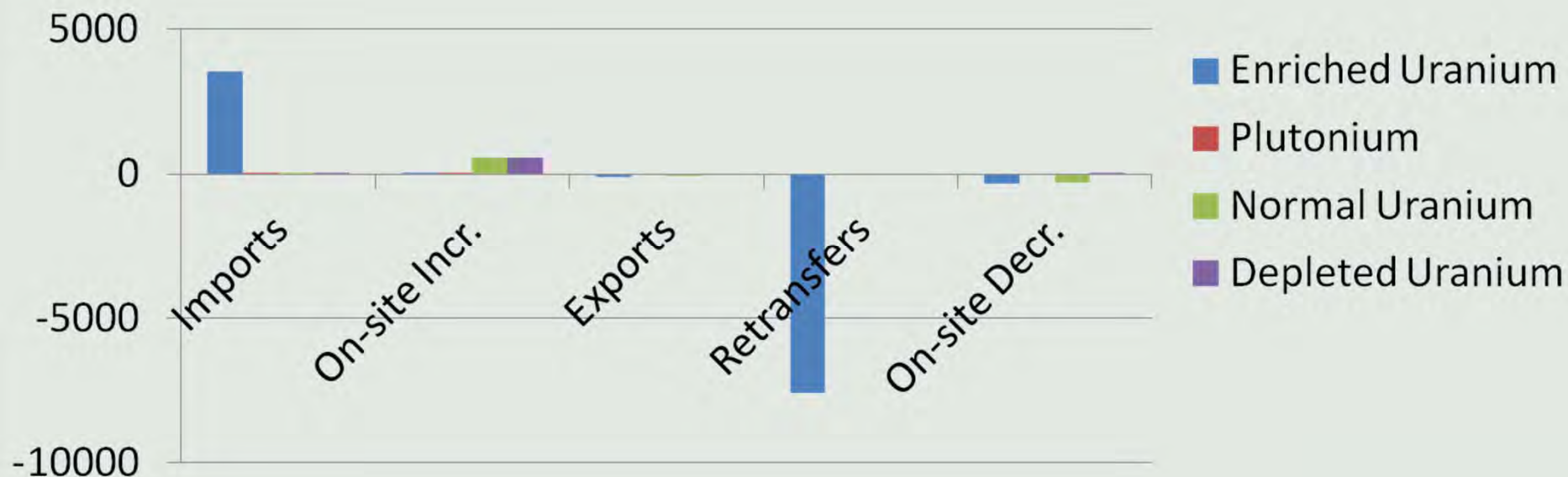
Material	Element Weight	Isotope Weight	Unit
Enriched Uranium	11,395	204	MT
Plutonium	109	-	MT
Normal Uranium	65	-	MT
Depleted Uranium	2,125	-	MT





# Obligations Accounting

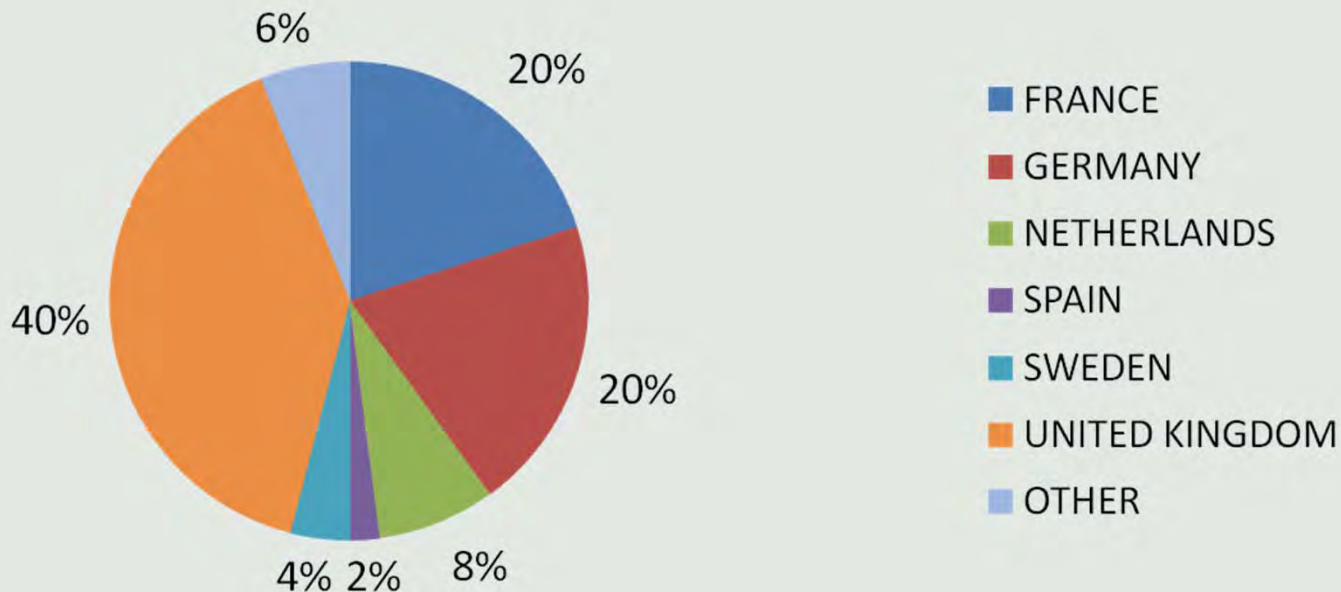
## Activity for Euratom Obligated Material 2010-2012





# Obligations Accounting

## Distribution of Euratom Obligations 2010-2012





# Obligations Accounting

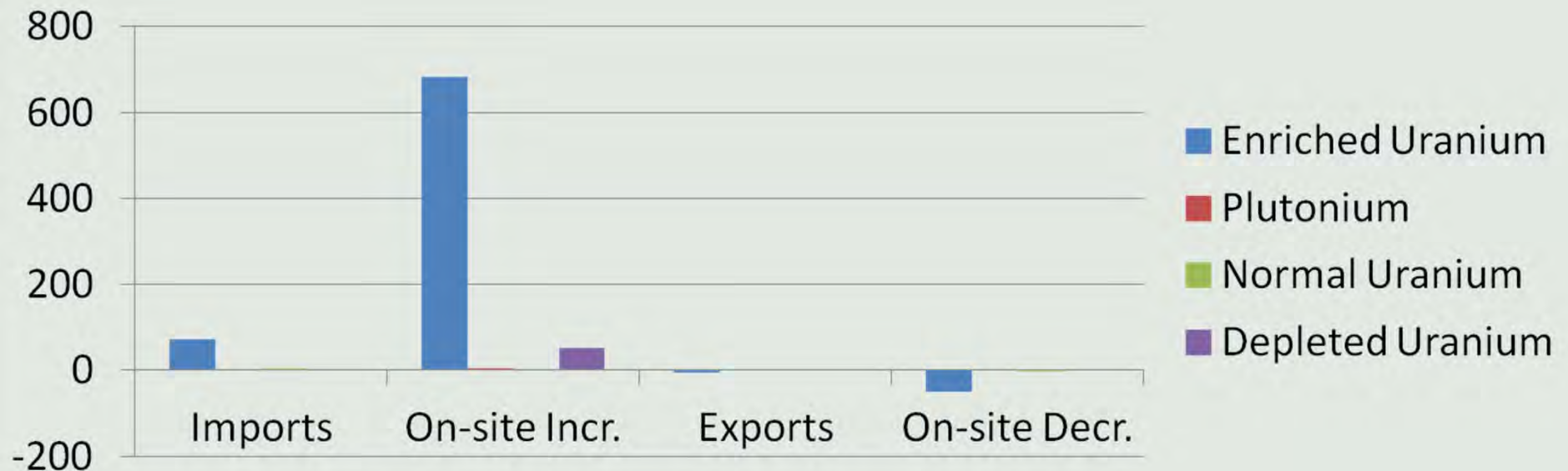
## Total Obligations for Japan December 31, 2012

Material	Element Weight	Isotope Weight	Unit
Enriched Uranium	1,918	31	MT
Plutonium	18	-	MT
Normal Uranium	1	-	MT
Depleted Uranium	102	-	MT



# Obligations Accounting

## Activity for Japan Obligated Material 2010-2012





# Obligations Accounting

## NMMSS Reporting Issues with Obligations

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





# Obligations Accounting

## CASE Studies

- Import of material from Euratom to the United States
- Import of material from Australia to the United States
- Export of material from the United States to Euratom
- Export of material from the United States to Canada
- Retransfer from Canada to Euratom
- Retransfer from Australia to Euratom



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# Obligations Accounting

## Questions?