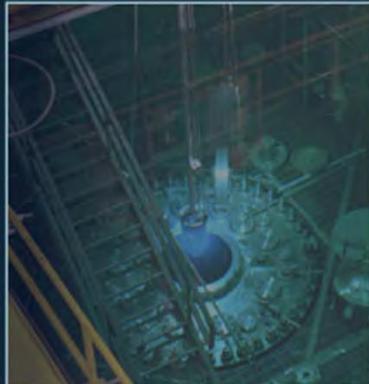


ACCURACY

PERFORMANCE

ACCOUNTABILITY

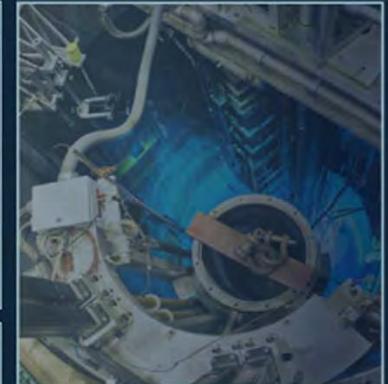


THE NUCLEAR MATERIALS MANAGEMENT AND SAFEGUARDS SYSTEM (NMMSS)

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Transit Matching

Brian Horn, NRC
Gary Hirsch, PSI



■ What is Transit Matching

- Defines IAEA activities to maintain information on the transit accounts of safeguarded nuclear material reported to the Agency.
- It is performed on inventory changes which indicate increases, decreases and adjustments to nuclear material balances.
- The IAEA receives 2 million nuclear material accounting records a year, in 2012 the US reported 5069 under the voluntary offer (INFCIRC/207)

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US Documented

1,859 Exports to 23 Countries

2,684 Imports from 19 Countries





- The IAEA Tracks 7 material types
 - Depleted Uranium (MT 10)
 - Enriched Uranium (MT 20)
 - Plutonium (MT 50)
 - Uranium-233 (MT 70)
 - Normal Uranium (MT 81)
 - Plutonium-238 (MT 83)
 - Thorium (MT 88)

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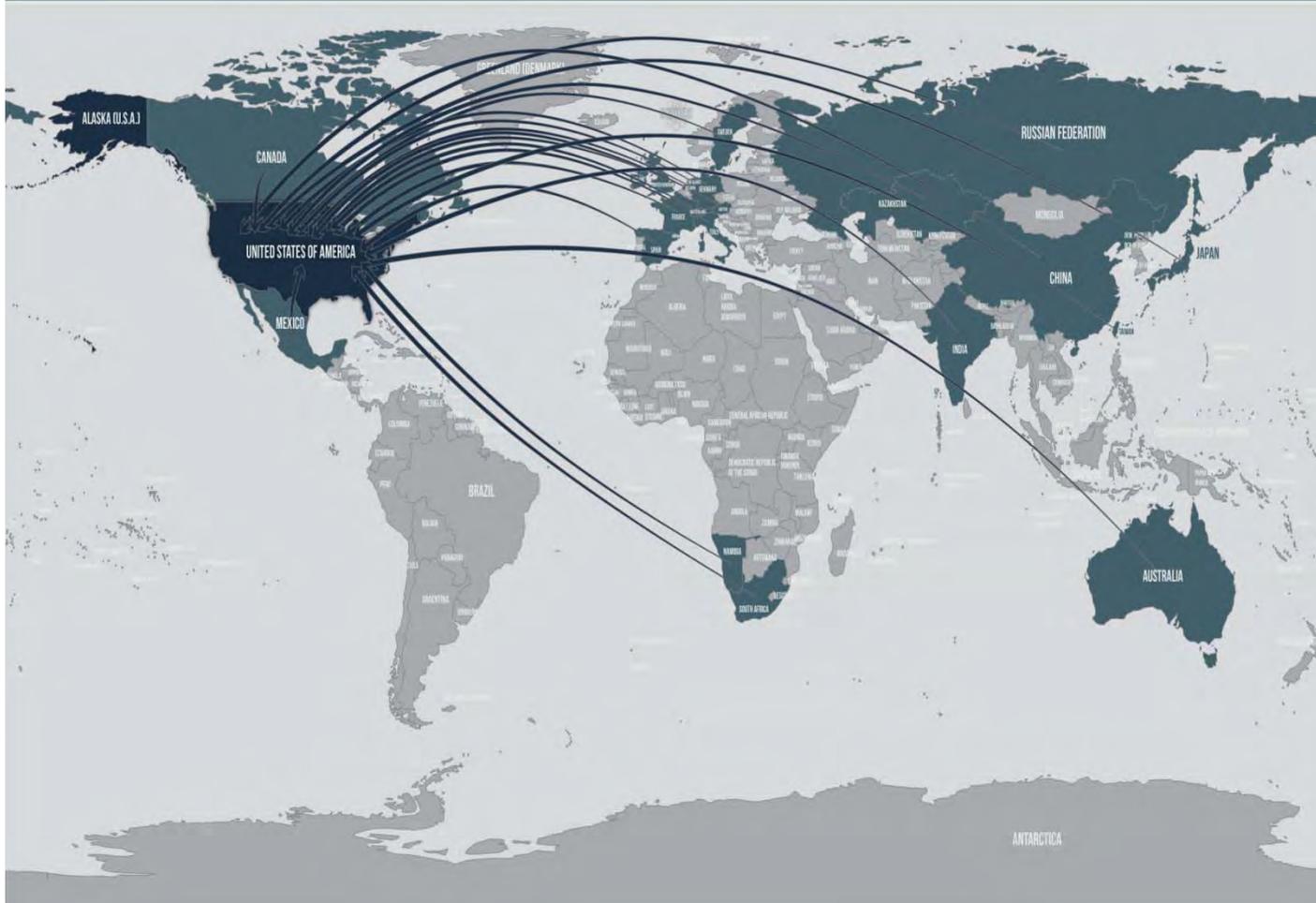
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Natural Uranium Imports



- Australia
- Canada
- France
- India
- Japan
- Kazakhstan
- South Africa
- United Kingdom
- Namibia

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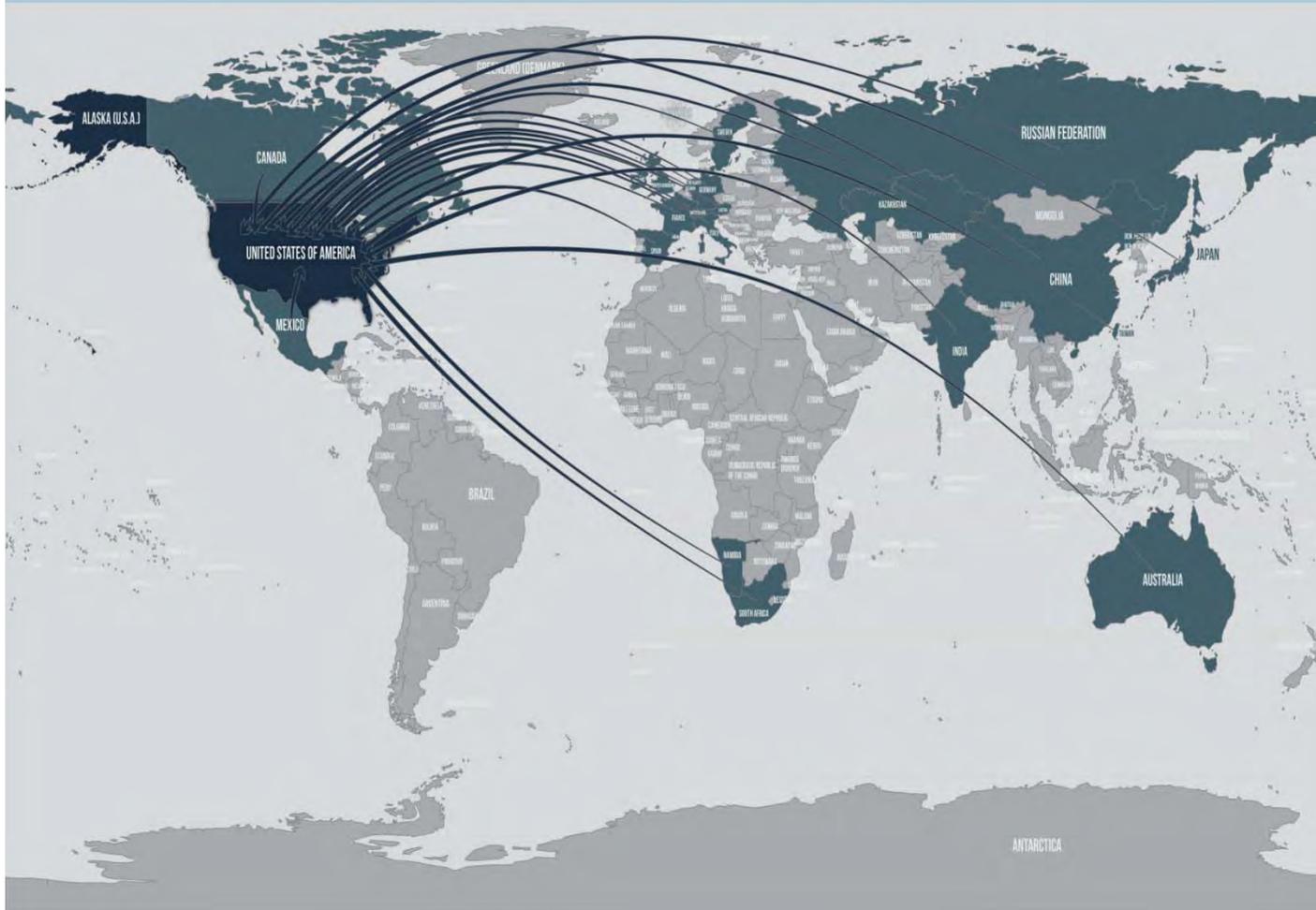
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Plutonium Imports



- Austria
- Germany
- Japan
- Mexico
- Sweden

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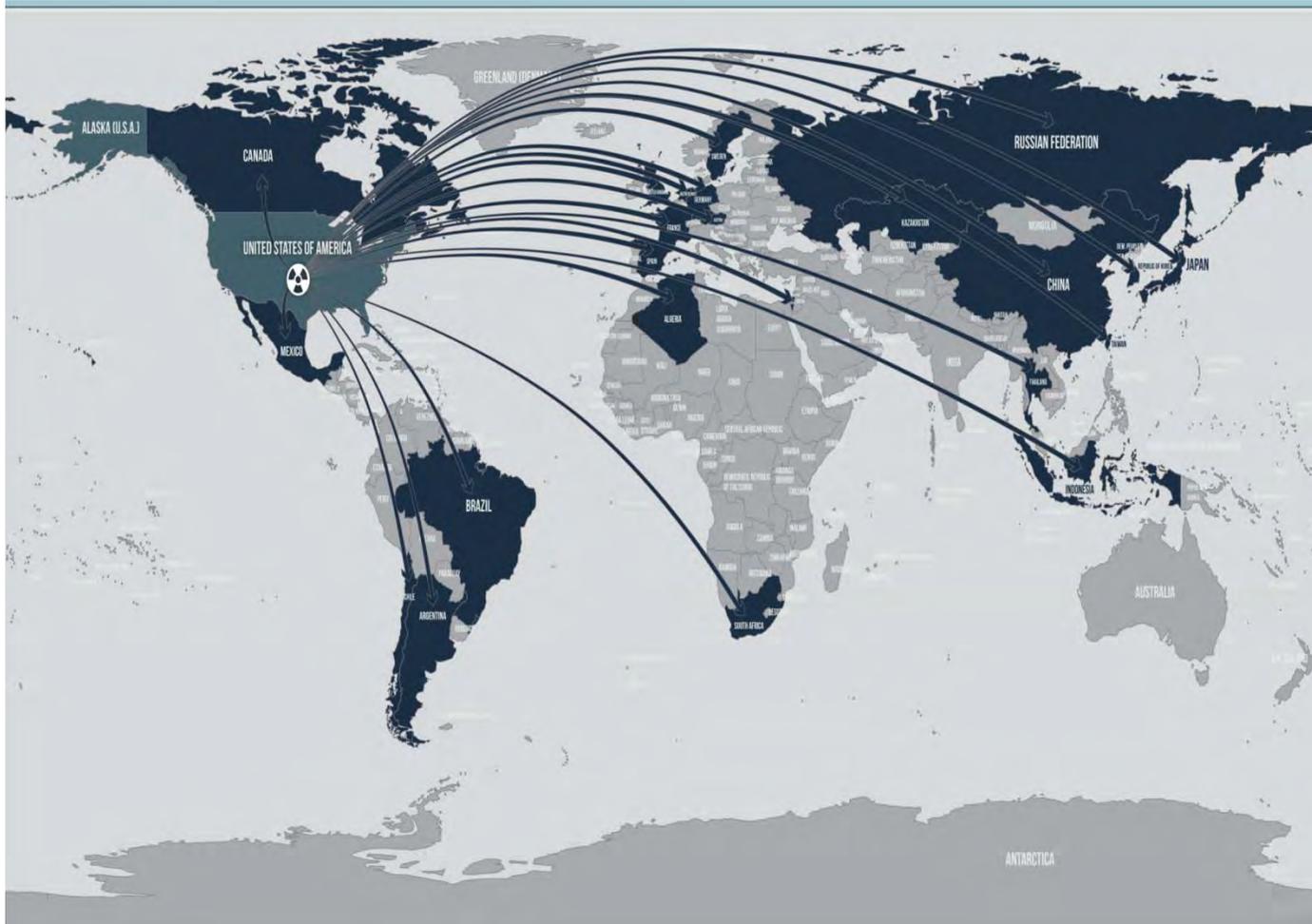
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Enriched Uranium Exports



- Algeria
- Argentina
- Austria
- Brazil
- Chile
- Taiwan
- Canada
- France
- Germany
- Indonesia
- Japan
- Kazakhstan
- South Korea
- Mexico
- Netherlands
- Spain
- South Africa
- United Kingdom
- Sweden

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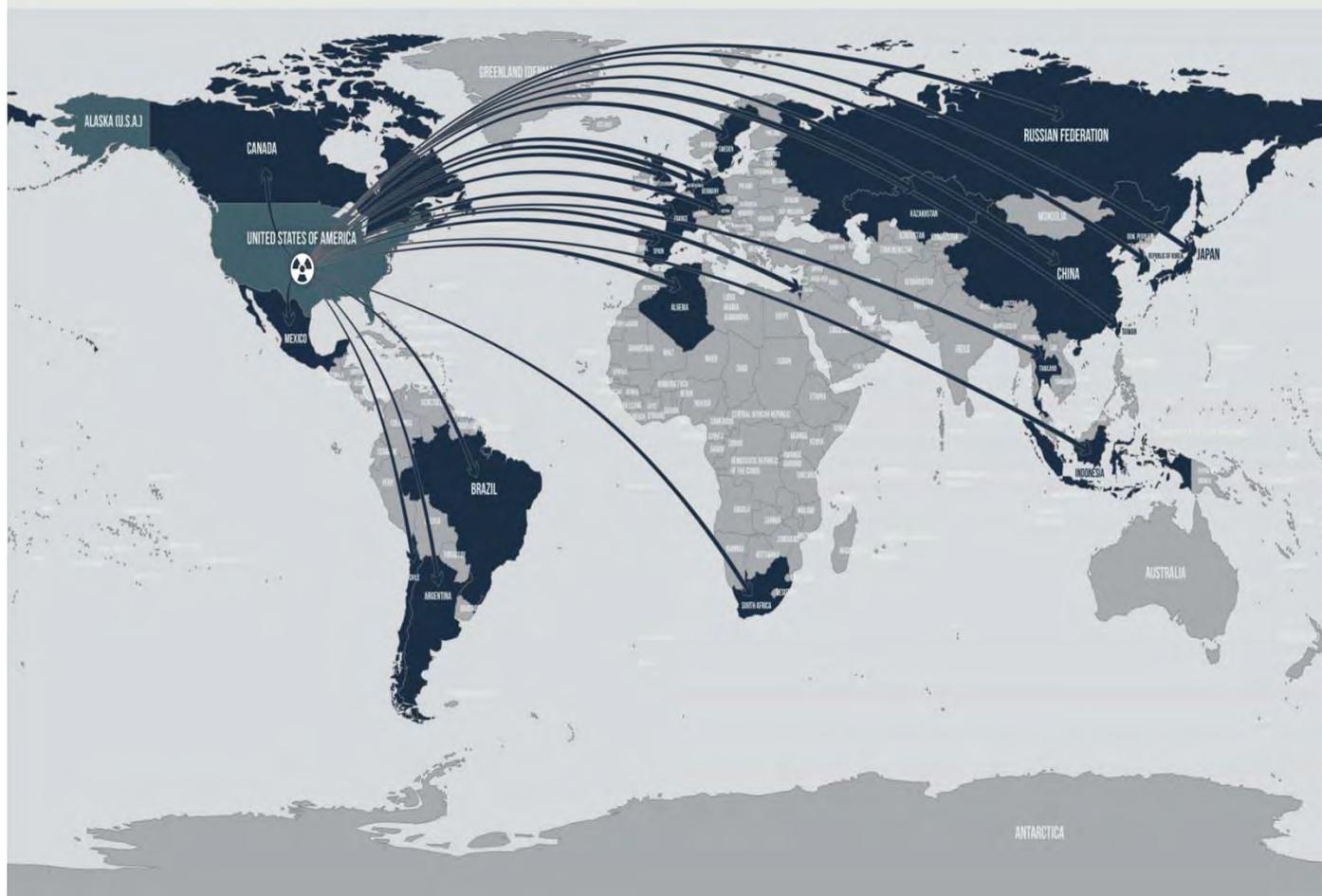
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Natural Uranium Exports



- Canada
- France
- Germany
- Netherlands
- Russia
- Thailand
- United Kingdom

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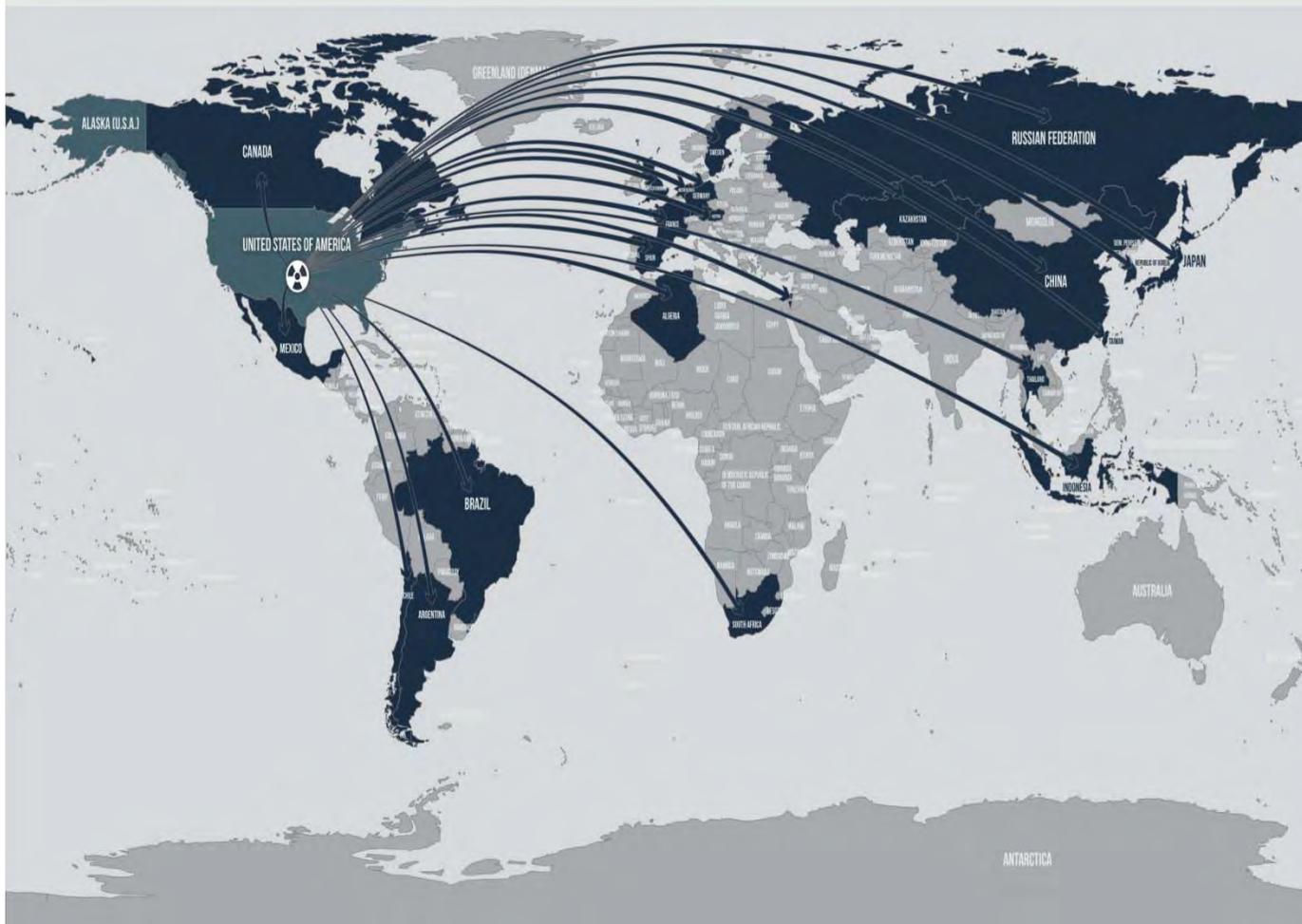
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Thorium Exports



- Germany
- Japan
- Thailand
- Israel
- United Kingdom

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■ Monthly IAEA Reporting Requirements

- Most countries report, each month:
 - Listing of nuclear material imports into their country
 - Listing of nuclear material exports from their country
 - These are called Inventory Change Reports (ICRs)
- The IAEA receives ~ 68 of these monthly reports



US / IAEA Reporting Activity

- IAEA data processing
 - Each Inventory Change Report is loaded into the database
 - The Agency generates an Activity Summary
 - The IAEA's system attempts to match shipper/receiver data
 - Unmatched data is manually reviewed
 - The IAEA provides the US with a listing of unmatched data



Import Communication

Page: 1

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SHIPMENTS to United States of America reported by Australia which the Agency has been unable to match

Previous Periods: 19820101 thru 20120930 as of 20130201

A SSSSS
A A S
A A SSSSS
AAAAA S
A A SSSSS

-----RN-----	--EN--	ZK	---DV---	-MF-	-FT-	-KC-	-----BN-----	-IQ-	-MD-	EC/IC	-----EW/IW-----	MB	CN	--TR--	--TE--
143	2		20120814	AS-D	U	2	N208D1	1	D31F	E	737.190g	T	Y		
										G	444.830g				
143	3		20120814	AS-D	U	2	N208D2	1	D31A	E	767.340g	T	Y		
										G	463.610g				
143	4		20120814	AS-D	U	2	N18101	1	GQGB	E	515.960g	M	Y		
										G	479.830g				
143	5		20120814	AS-D	U	2	N010	1	B32F	E	189.040g	T	Y		
										G	151.230g				
238	5		20090211	AS-E	U	2	N200	44	ODLC	D	964.440k	L	Y		
238	36		20090211	AS-E	U	2	N327	7	TD1A	D	2013.000k	L	Y		
293	54		20110630	AS-E	U	2	N052	1	OD1A	N	1215.200k	T	Y		
293	55		20110630	AS-E	U	2	N053	15	OD1A	N	122.920k	T	Y		
293	56		20110630	AS-E	U	2	N056	16	OD1A	N	3656.370k	T	Y		
293	57		20110630	AS-E	U	2	N130	1	OD1A	N	1024.400k	T	Y		
293	58		20110630	AS-E	U	2	N151	1	OD1A	N	358.200k	T	Y		
545	9		20091109	AS-C	U	2	N241	3	FUAD	D	63.880k	T	Y		



Import Communication

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SHIPMENTS to United States of America reported by Mexico which the Agency has been unable to match
Previous Periods: 19820101 thru 20120930 as of 20130201

M M X X
M M X X
MM MM X
M M X X
M M X X

-----RN-----	--EN--	ZK	---DV---	-MF-	-FT-	-KC-	-----BN-----	-IQ-	-MD-	EC/IC	-----EW/IW-----	MB	CN	--TR--	--TE--
182	30		20120223	MX-A	U	2	8832	1	B51G	E	180.180g	M	*		
										G	123.270g				
182	31		20120223	MX-A	U	2	8841	1	B51G	E	180.010g	M	*		
										G	123.170g				
182	32		20120223	MX-A	U	2	8850	1	B51G	E	180.190g	M	*		
										G	123.280g				
182	33		20120223	MX-A	U	2	8823	1	B51G	E	180.280g	M	*		
										G	123.350g				
182	34		20120223	MX-A	U	2	8867	1	B51G	E	180.140g	M	*		
										G	123.260g				
182	35		20120223	MX-A	U	2	8848	1	B51G	E	179.930g	M	*		
										G	123.110g				
182	36		20120223	MX-A	U	2	8836	1	B51G	E	180.050g	M	*		
										G	123.210g				
182	37		20120223	MX-A	U	2	8824	1	B51G	E	180.160g	M	*		
										G	123.260g				
182	38		20120223	MX-A	U	2	8996	1	B51G	E	151.530g	M	*		
										G	103.670g				
182	39		20120223	MX-A	U	2	8829	1	B51G	E	181.030g	M	*		
										G	123.870g				
182	40		20120223	MX-A	U	2	8833	1	B51G	E	180.150g	M	*		
										G	123.260g				
182	41		20120223	MX-A	U	2	8997	1	B51G	E	150.950g	M	*		
										G	103.280g				
182	42		20120223	MX-A	U	2	7563	1	B51G	E	179.260g	M	*		
										G	122.660g				
182	43		20120223	MX-A	U	2	8837	1	B51G	E	179.790g	M	*		
										G	123.020g				
182	44		20120223	MX-A	U	2	7520	1	B51G	E	178.960g	M	*		
										G	122.440g				
182	45		20120223	MX-A	U	2	8842	1	B51G	E	179.820g	M	*		
										G	123.030g				
182	46		20120223	MX-A	U	2	7521	1	B51G	E	178.880g	M	*		
										G	122.400g				
182	47		20120223	MX-A	U	2	8849	1	B51G	E	179.700g	M	*		
										G	122.950g				
182	48		20120223	MX-A	U	2	8835	1	B51G	E	179.550g	M	*		
										G	122.840g				
182	49		20120223	MX-A	U	2	8843	1	B51G	E	179.880g	M	*		
										G	123.080g				
182	50		20120223	MX-A	U	2	8993	1	B51G	E	151.740g	M	*		
										G	103.820g				
182	51		20120223	MX-A	U	2	8846	1	B51G	E	180.400g	M	*		
										G	123.430g				
182	52		20120223	MX-A	U	2	8852	1	B51G	E	179.420g	M	*		
										G	122.760g				
182	53		20120223	MX-A	U	2	8847	1	B51G	E	179.920g	M	*		
										G	123.100g				
182	54		20120223	MX-A	U	2	7517	1	B51G	E	179.360g	M	*		
										G	122.710g				

THE NUCLEAR MATERIALS MANAGEMENT AND SAFEGUARDS SYSTEM (NMMSS)

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- The IAEA uses the following information when matching the data
 - Batch name
 - Type of nuclear material
 - Country from / Country to
 - Date of shipment

- US Manual Transit Matching
 - Has the activity been reported to NMMSS?
 - Has the activity been reported to the Agency?



■ Current Transit Matching Status

- Latest report received through 12/1/2012 (received in March)
- Open transactions for imports from 6 countries
 - Australia, Canada, South Korea, Mexico, Great Britain, EURATOM
- 75 lines open ranging in date from 2007 – 2012
 - 2 lines Plutonium
 - 61 lines Enriched Uranium
 - 12 lines Depleted and Natural Uranium



US Transit Matching Activity

- Review Import Communication
 - Look for new items / already resolved items
 - Look at newer activity first
 - Look at Plutonium, Enriched Uranium, Thorium, Depleted Uranium, Natural Uranium in order
 - Look at larger quantities of material first
- Review NMMSS
 - Look at TJ-23, TJ-45, IAEA Reports, search database
- Report findings to IAEA
- Support provided by NRC and DOE



US Response

United States
Import Communication 2012-08-08

Canada (CN)		US Reporting	
Report Number	Entry Number	Report Number	Entry Number
4	1	ICR-207	428 1-2

Mexico (MX)		US Reporting	
Report Number	Entry Number	Report Number	Entry Number
181	41-68	ICR-207	422 3-4

Great Britain (Q)		US Reporting	
Report Number	Entry Number	Report Number	Entry Number
3019	574-582	ICR-288-XXX	361 216-225

EURATOM (W)		US Reporting	
Report Number	Entry Number	Report Number	Entry Number
557	2	ICR-207	410 49,51,53,55



Conclusion

- Common matching issues
 - Shipper batch name differs from receiver batch name
 - Shipper sends a UF6 cylinder plus a sample bottle and the US receiver is two locations (lab and fuel facility)
 - Shipper batch name is a spent fuel container and receiver batch name is twenty fuel assemblies in the container
 - Shipper reports depleted uranium shipping container US regulations do not require reporting

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Conclusion

- NMMSS / Facility Joint Effort
 - Report timely
 - Report accurately
 - Respond to inquiries about reporting