

The Nuclear Materials Management and Safeguards System (NMMSS)



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Accuracy

Accountability

Performance



May 11-14, 2015

Las Vegas, NV

NMMSS Strategy and Analytical Approach for Validating the Accuracy Of Nuclear Material Data

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Purpose



NISA



- NMMSS Provides information and data of significance to the U.S. Government.
- Data integrity is of paramount importance.
- This presentation provides an overview of NMMSS strategy and analytical approach to data validation.



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Context



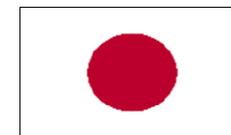
Validation and verification of NMMSS data are critical in the ability to provide high quality, accurate and complete information to customers, both domestic and international.



EURATOM



IAEA
International Atomic Energy Agency



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NMMSS Products Depend on Timeliness and Accuracy of Data



Critical & Time-Sensitive Nuclear Material Information

- Required U.S. Reporting to the IAEA under International Safeguards Agreements
- Nuclear Materials Financial Management (Asset Tracking for CFO)
- Critical Support of Regulatory Functions including NRC and DOE/NNSA MC&A Inspections
- Demonstrate Compliance with Peaceful use Agreements for Nuclear Commerce
- Public and Worker Health Studies

Specialized Reports & Analysis

- Highly Enriched Uranium Inventories
- Plutonium
- Advocate Support to National Security Council, State Department, etc.

Reconciliation of DOE & Civilian Nuclear Material Inventories

Training to strengthen Domestic & International Nuclear Material Accounting Practices



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Analytical Framework



- Systematic approach
- Built-in, multi-layer checks and balances
- Consists of five primary elements:
 1. Data provided by industry and government facilities
 2. Formal reconciliation of facility/licensee specific data
 3. Communication data provided as part of 123 Agreement for Cooperation Administrative Arrangements
 4. Formal feedback provided by the IAEA
 5. Formal annual reporting and reconciliation of foreign obligated nuclear material in the U.S. with foreign entities



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NMMSS Data / Validation Multi-Layered "Rings"



123 Agreement Communications

IAEA Semi-Annual Report

IAEA Quarterly Report

Step 1: NMMSS Data Verification

Step 2: DOE/NRC Reconciliation

Step 3: 123 Agreement Communication Transit Matching

Step 4: IAEA Transit Matching

Step 5: 123 Agreement Entity/U.S. Reconciliation



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Step 1

Is U.S. Facility data Submission Complete?



NMMSS automatically validates facility data reported to the NMMSS to verify data quality and adherence to applicable regulations.

- During data import, information is evaluated for format and accuracy of fundamental required field checks.
- Record level edit checks are in place for transactions, inventory, and material balance data.
- Compatibility edit checks between shipper/receiver documents are performed for transaction data.



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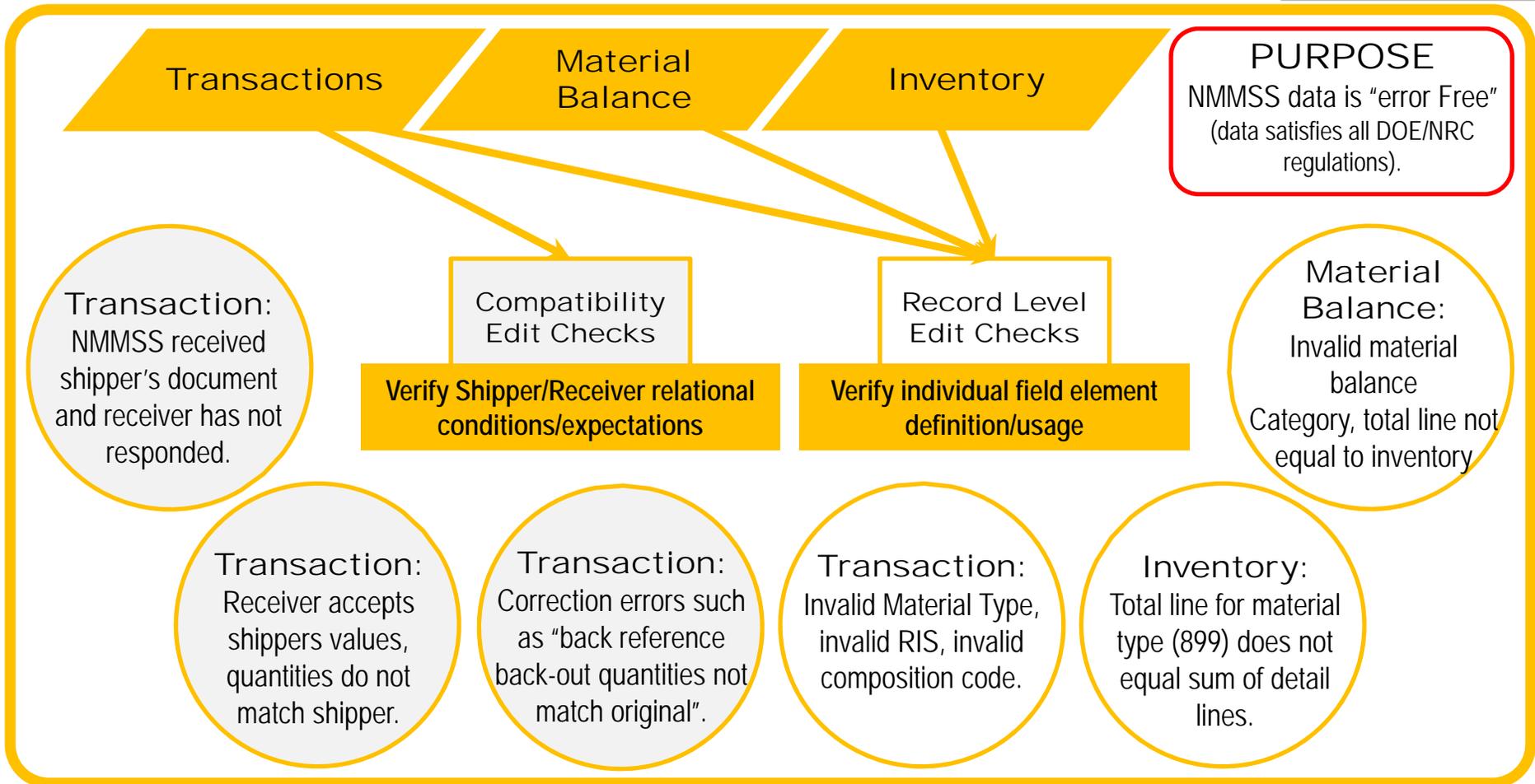
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Step 1

Mechanics of Validating for Data Completeness

Process Flow Diagram



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Step 2

Formal Reconciliation of U.S. Facilities



NMMSS works with U.S. facilities to validate their inventories, material balances (NRC), and obligations with NMMSS records (transactions).

- Reconcile transactions, inventories, DOE projects, and obligations.
- Reconcile facilities according to DOE/NRC regulations.

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Step 2 Mechanics of Validating Accuracy through Reconciliation

Process Flow Diagram



NUREG/BR-0006

DOE Order 474.2

NUREG/BR-0007

U.S. Facilities

(Having reportable quantities of Nuclear Material)



PURPOSE
NMMSS balanced with U.S. facilities.

Balance All Government Projects

All Transactions Reported to NMMSS and error free

Balance All Foreign Obligations

Transactions

Facility Reported Inventory

Verify Transaction Activity with Inventory/ Material Balance

Verify Reported Inventory and Material Balance

Facility Reported Material Balance (NRC)



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Step 3

Leveraging Other Data Sources to Validate - 123 Agreement Communications



NMMSS validation of 123 Agreement Communications with facility transactions assists in assuring data quality and accuracy when reporting to Agreement Partners.

- Ongoing transit matching of NMMSS transactions to 123 Agreement communications are performed.
- Quarterly reporting of transit matching results are delivered to DOE.
- NMMSS works with U.S. facilities and 123 Agreement Partners to Identify and correct discrepancies identified between 123 Agreement Partners and associated U.S. facilities.

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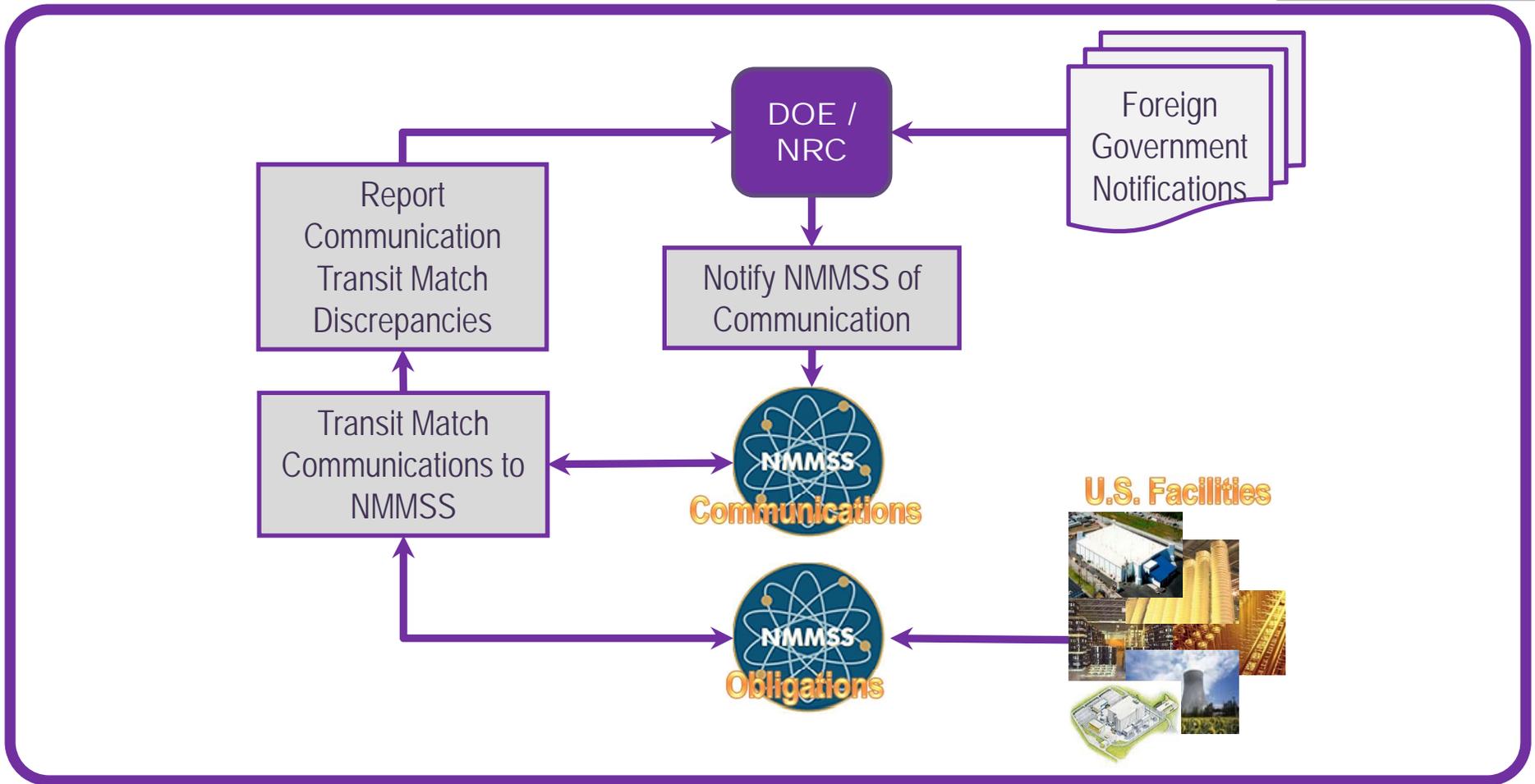


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Step 3

NMMSS Background for 123 Agreement Communications

Communications Flow Diagram



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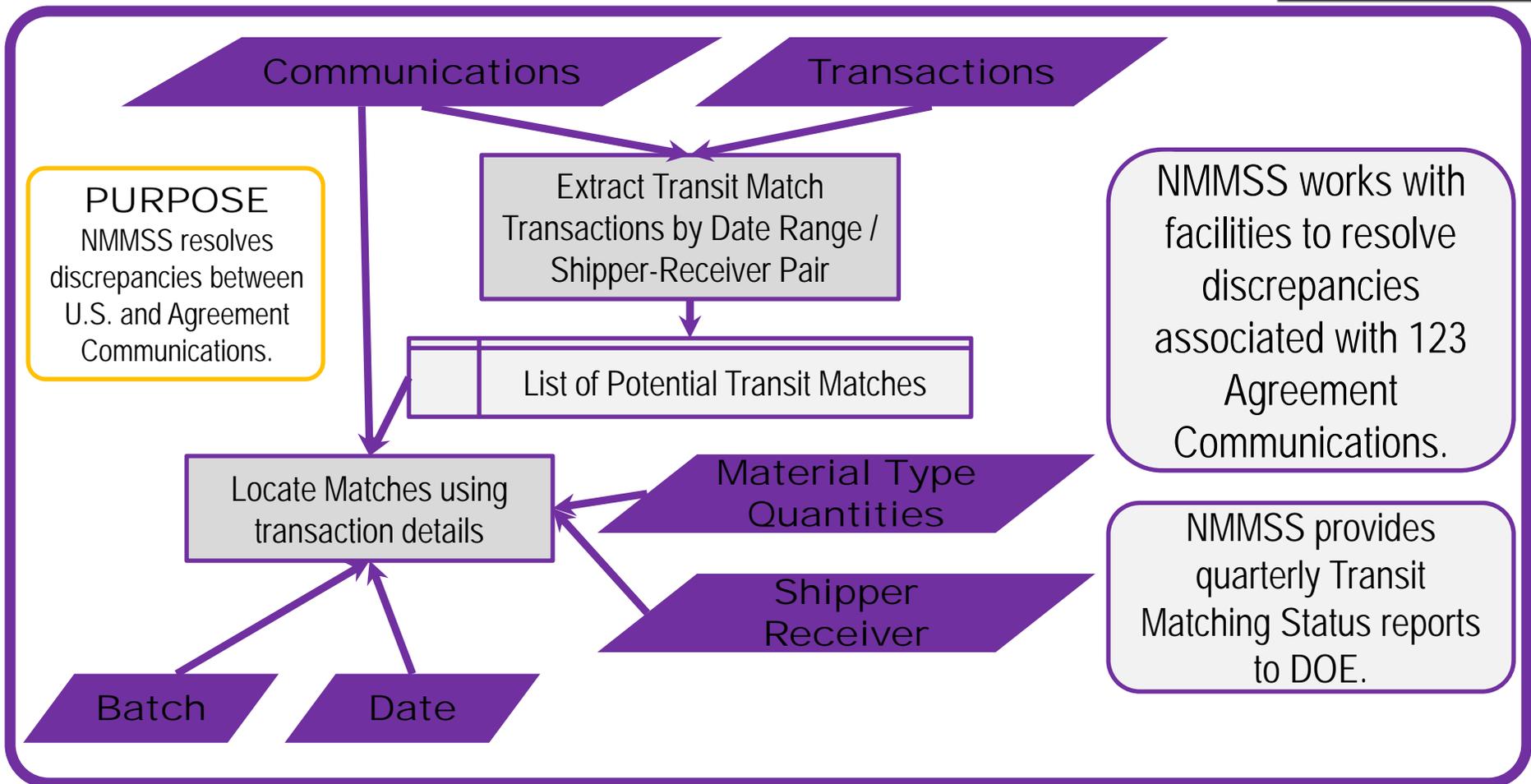
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Step 3

Mechanics of Validation Using 123 Agreement Communications

Process Flow Diagram



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Step 4

Leveraging Other Data Sources to Validate - IAEA



NMMSS reports to the IAEA and validates/transit matches facility reporting with IAEA reported balances.

- Monthly reporting of U.S. transactions are delivered to the IAEA.
- Periodic transit matching of NMMSS transactions to IAEA reported balances are performed.
- Semi-Annual reporting of U.S. inventory/material balance (selected facilities) are delivered to the IAEA.

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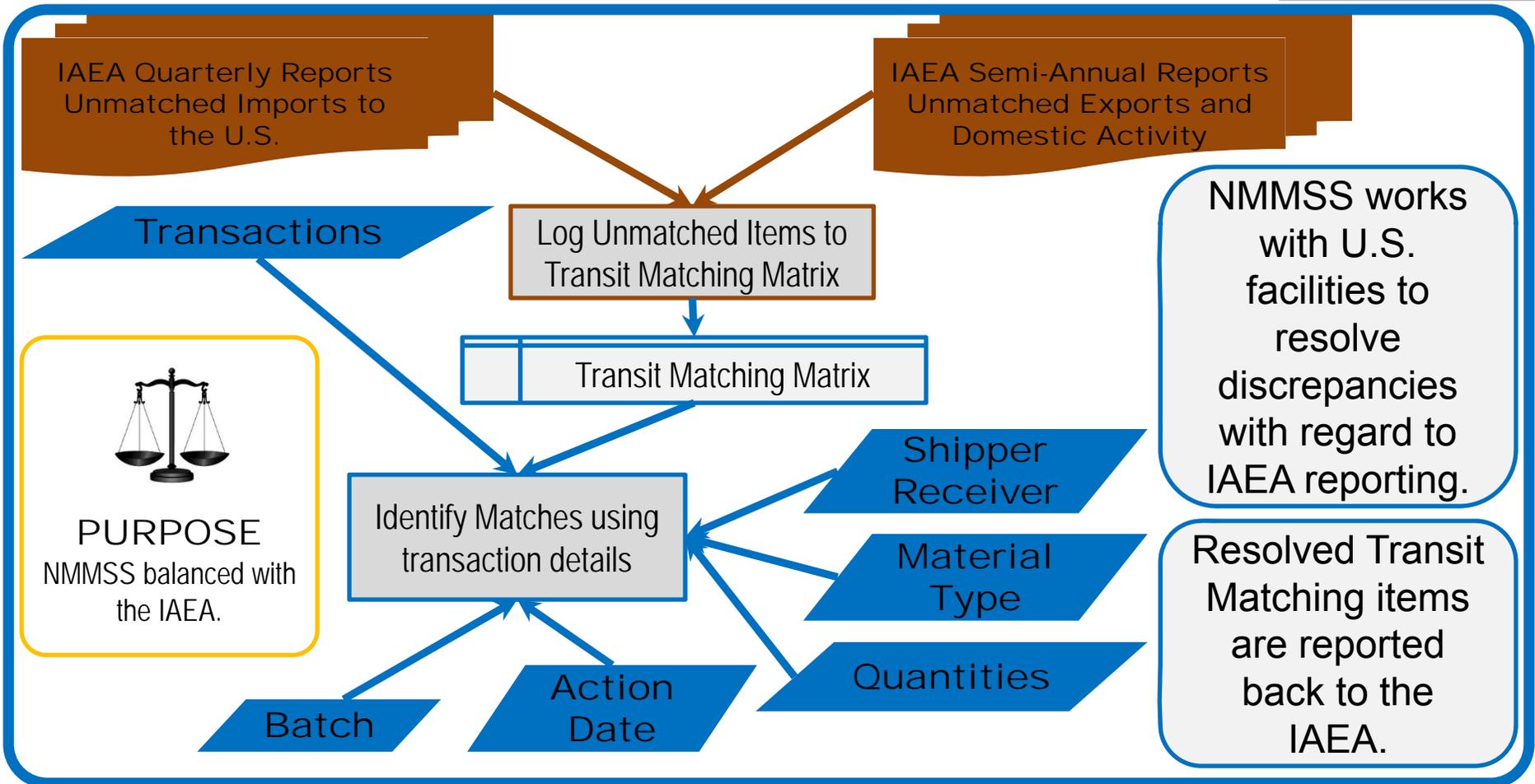


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Step 4

Mechanics of Validation Using IAEA Information

Process Flow Diagram



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Step 5

Leveraging Other Data Sources to Validate – 123 Agreement Annual Reporting / Reconciliation



NMMSS produces annual obligation inventory reports of which the U.S. distributes to associated 123 Agreement Partners. The NMMSS provides support in reconciling these reports with the records of each 123 Agreement Partner.

- Administrative arrangements with 123 Agreement Partners may require the production of annual obligation inventory reports.
- These reports are used by the 123 Agreement Partners to reconcile their books with the U.S.
- NMMSS provides support and analysis as needed to resolve discrepancies in the reconciliation process.

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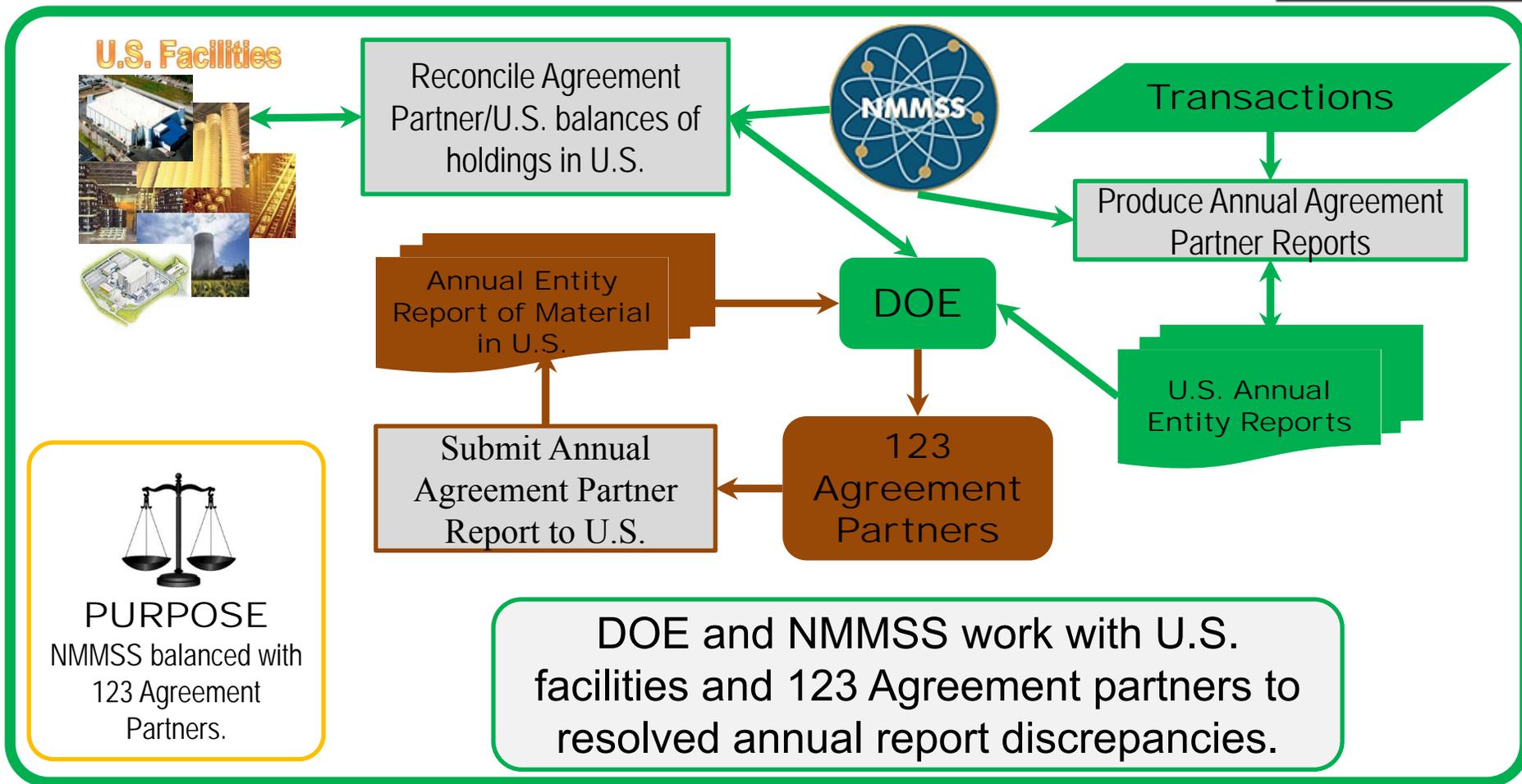


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Step 5

Mechanics of Validation Using 123 Agreement Annual Reporting / Reconciliation

Process Flow Diagram



PURPOSE
NMMSS balanced with 123 Agreement Partners.

DOE and NMMSS work with U.S. facilities and 123 Agreement partners to resolved annual report discrepancies.



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Summary



NNSA



- The validation of NMMSS data is accomplished using multiple data and informational sources, both domestic and international.
- NMMSS data is used to support non-proliferation and national security endeavors. Data validation plays a crucial role in assuring high quality and accuracy to support external agencies.
- Data validation is a continuous improvement process.



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Questions

