



Accountability
Performance
Accuracy

The Nuclear Materials Management Safeguards System

NMMSS

2016

Annual Users Training Meeting

May 9-12, 2016 | New Orleans, LA

Nuclear Material Inventory Assessment (NMIA)

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Objective

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- Overview
 - Accountable Nuclear Materials
 - NMIA Database
- Requirements
- Programmatic Relationships
- Data Applications
 - DOE and NNSA Standard Reports
 - Non-standard/Information Only Reports
 - Material Supply and Demand Model/Analyses
- Questions





Accountable Nuclear Materials

DOE Order 410.2, *Management of Nuclear Materials*, defines accountable nuclear material as:

- Americium-241
- Americium-243
- Californium
- Curium
- Deuterium
- Enriched lithium
- Neptunium-237
- Plutonium-238
- Plutonium-239 – 241
- Plutonium-242
- Thorium
- Tritium
- Depleted Uranium
- Normal Uranium
- Enriched Uranium
- Uranium-233



Requirements for NMIA

“To establish requirements for the life-cycle management of DOE-owned and/or – managed accountable nuclear materials”

DOE Order 410.2, Management of Nuclear Materials

■ Requirement for Inventory Assessments:

- “Each DOE field element responsible for [accountable] nuclear materials...must prepare an annual Nuclear Material Inventory Assessment (NMIA) Report unless otherwise amended or exempted in the annual guidance provided by the ONMI [Office of Nuclear Materials Integration, NA-532].”

■ ONMI Responsibilities:

- “...collects and consolidates the data, maintains and protects data integrity, and provides selected data to authorized users in consultation with the other DOE headquarters organizations and or field elements.”

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NMIA Database

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- Each year, DOE and NNSA sites assess their nuclear material to:
 - document programmatic responsibility
 - describe characteristics of the material
- The assessment provides:
 - information on how the inventory will be used
 - identifies disposition plans for no-defined-use material
- NMIA is constructed from individual items in inventory at DOE/NNSA sites (500,000 records)
- NMIA data dates back to EFY 1994



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NMIA & NMMSS

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- NMIA contains a more detailed accounting of programmatic use, usage declaration and disposition tracking. For example:
 - Excess nuclear materials that have been removed from use in support of weapons programs
 - Components held for programmatic use (recycle)
- Site submittals are validated against:
 - NMMSS data, which has been rolled up by location, project, COEI (composition of ending inventory), and MTC (material type code)
 - Prior years of reconciled NMIA inventories



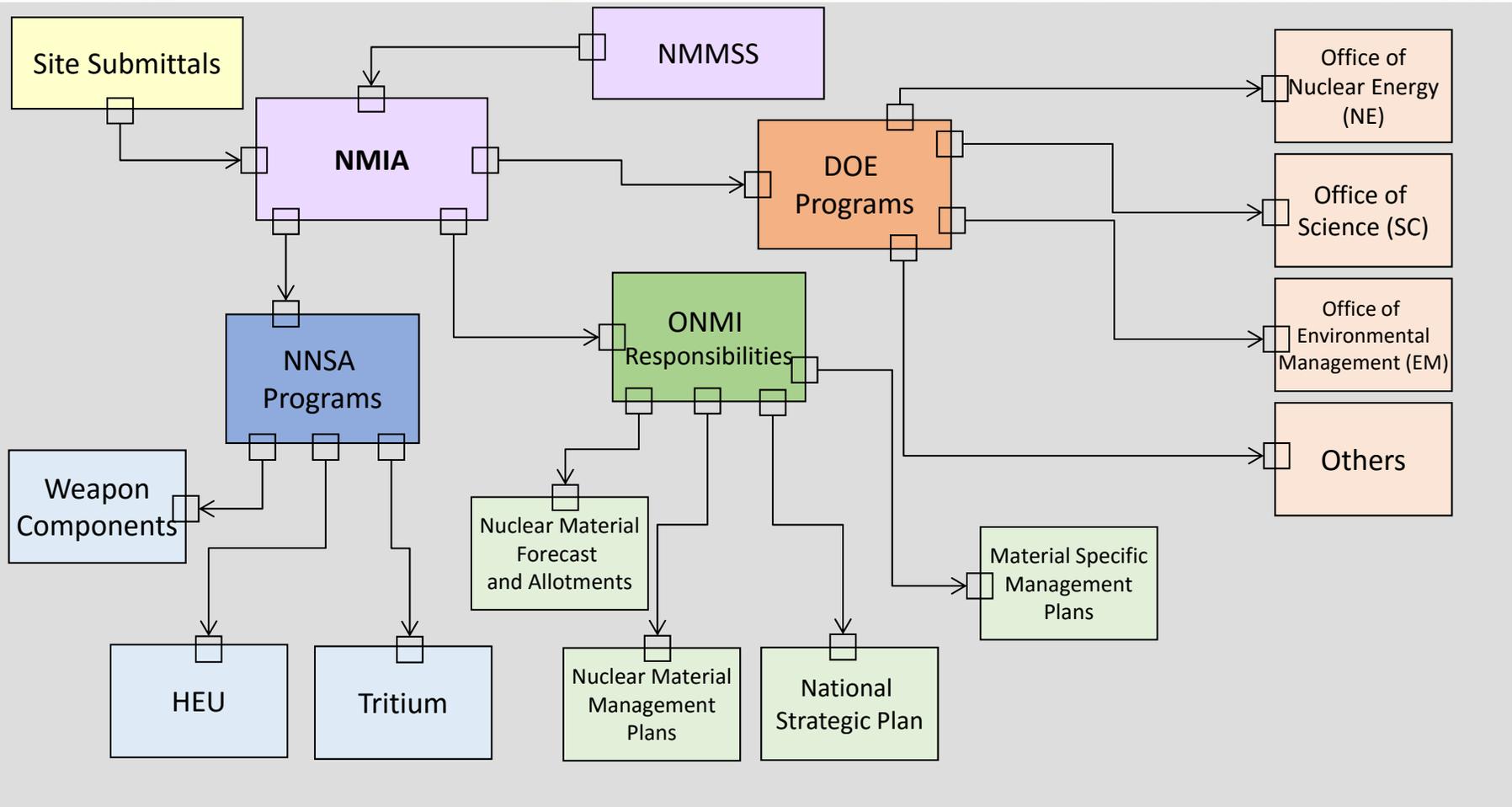
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Programmatic Relationships

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NMIA Data Applications

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- DOE and NNSA Standard Reports:
 - Summary material inventory reports
 - Disposition reports
 - Nuclear Material Plans
 - By Site
 - By Material
 - Nuclear Material Forecast and Allotments (NMFAR)

- Non-Standard/Information Only reports
 - Specialized material reports as requested

- Material Supply and Demand Modeling/Analyses for NNSA programs
 - Production planning
 - Weapon material planning
 - Strategic planning
 - As requested



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Examples of Standard Reports

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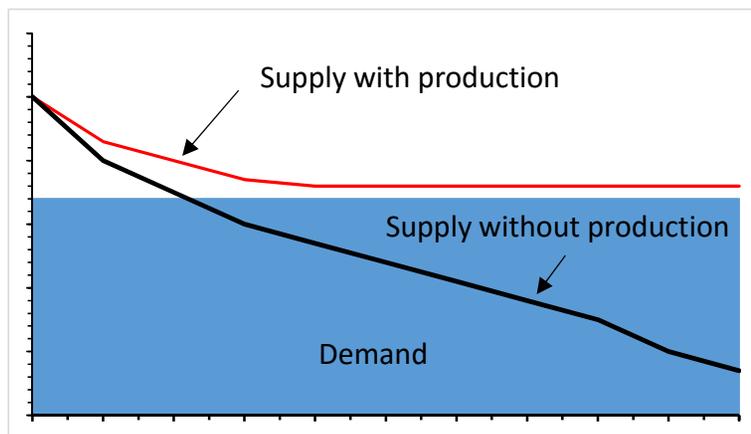
■ Yearly Reports

- EFY Site Inventory Feedback Reports
- Assets & Liabilities (DOE Chief Financial Officer, CFO)
- National Security vs. Excess Inventories (NNSA Office of Nonproliferation, NA-20)
- Heavy Isotopes (DOE Office of Science)
- Plutonium-238 report (DOE Office of Nuclear Energy)

■ Multi-Year Reports

- Basis for Nuclear Material Management Plan (NMMP) & Nuclear Material Forecast and Allotments (NMFAR) Analyses, National Strategic Plan (NSP), Material Specific Management Plan (MSMP)
 - Defined use vs. No Defined Use
 - Disposition
- 1994 to Present by Material





- NMIA establishes the current fiscal year (FY) baseline inventory for the each of the material supply and demand models
 - Tritium, highly enriched uranium (HEU), and plutonium
- Models are included in Congressional Reports, Directives, Strategic and Programmatic Planning Documents

- DOE O 410.2, *Management of Nuclear Materials*
- DOE O 474.2, *Nuclear Material Control and Accountability*
- Nuclear Materials Inventory Assessment (NMIA) Guidance of EFY 2015 issued by ONMI (NA-532)

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Questions?



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Backups

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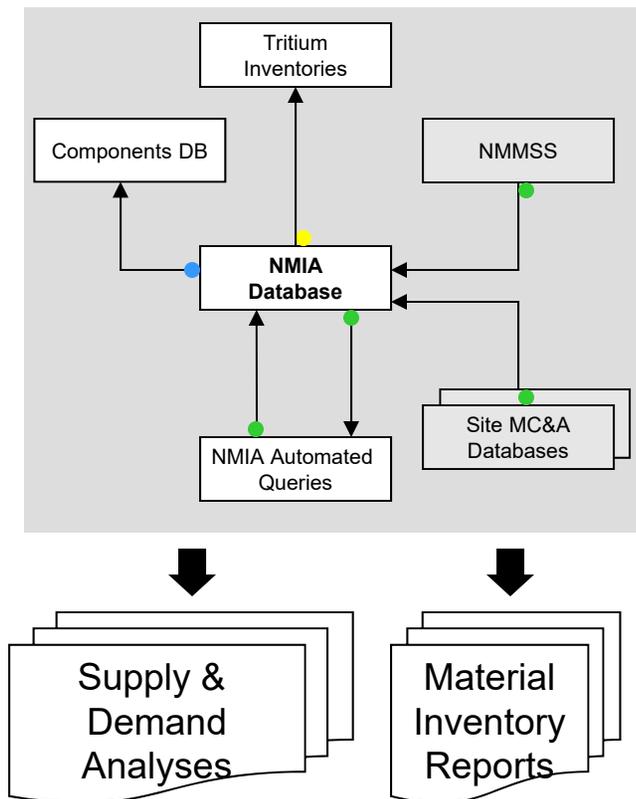


NMIA Process : Consolidate and Reconcile

- NMMSS summary level data

- EFY item-level site submittals input
 - Align and add HQ fields
 - Compare NMMSS summary level amounts with site-level data

- NMIA Tools (Access Application Database)
 - Creator Tool: site level tables into a single consolidated table to support complex-wide analysis
 - Extractor Tool: creates standard reports for various users in the DOE community (e.g. asset/liability report)
 - Multi-year Tool: generates multi-year material reports (e.g. historic trends)



Material Inventory Reports

Single Year Reports

- EFY Site Feedback Reports
- Assets & Liabilities (CFO)
- National Security vs. Excess Inventories (Nonproliferation)

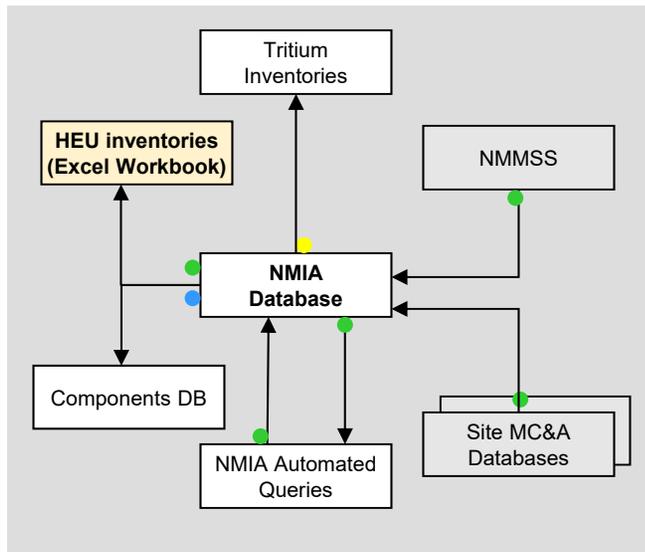
Multi-Year Reports

- Basis for Nuclear Material Management Plan (NMMP), Nuclear Material Forecast and Allotments (NMFAR) Analyses, Material Specific Management Plan (MSMP), National Strategic Plan (NSP)
 - » Defined use vs. No Defined Use
 - » Disposition
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NNSA Supply and Demand Analysis: HEU, Tritium

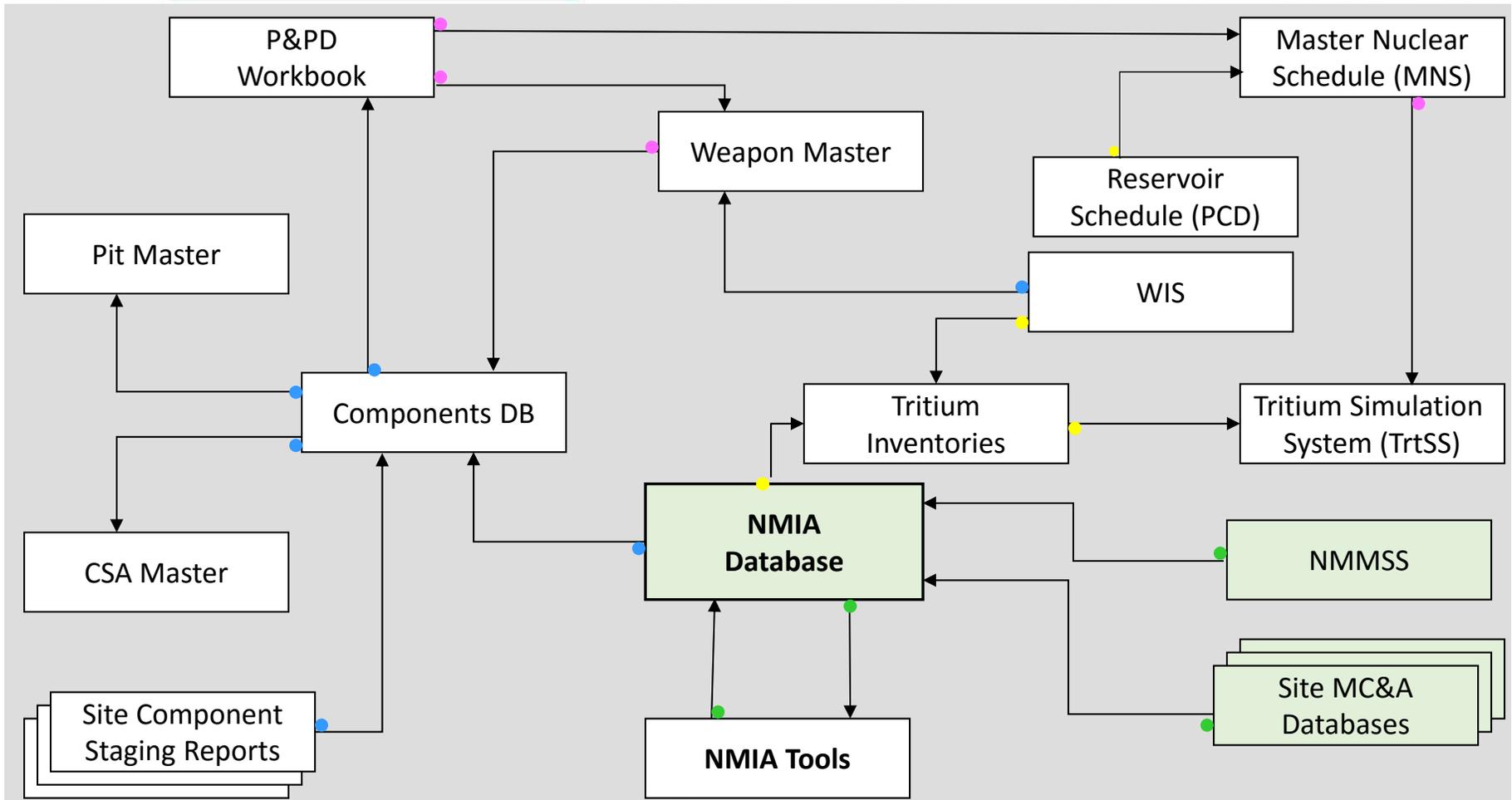
- Tritium & HEU Supply and Demand Model/Analysis

- NMIA current and historic inventories
- Planned supply/production
- Future material requirements



- Weapon Components

- Component Staging Reports required by P&PD
 - EFY Pit and CSA inventories submitted by sites and reconciled with the EFY NMIA inventories
- Stockpile Analysis



- Stockpile
- Pits & CSAs
- Materials
- Tritium & Reservoirs