



Improving Nuclear Material And Radionuclide Data Management In A Post-9/11 Environment

2005 NMMSS Users Annual Training Meeting

May 25, 2005

Len Myers

SO-20.3 (SAIC)



Background

- In late 2004 the DOE's Office of Safety and Security Performance (SSA) performed a special study of national-level database management for DOE's nuclear materials.
- Results were documented in a report prepared in December 2004 entitled *Improving Nuclear Material and Radionuclide Data Management In A Post -9/11 Environment*.
- The SSA special study team identified eight recommendations that would lead to improvements.



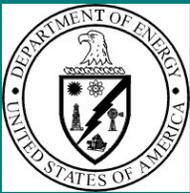
Study Purpose and Findings

- Purpose of the study was to recommend specific actions for modifying current systems and initiatives to better meet evolving DOE needs.
- Systems are not designed to meet information needs of the post-9/11 environment of:
 - Assuring the materials are accountable
 - Responding to emergency situations
 - Better coordination between DOE and NRC
 - Ability to respond to time-sensitive data requests
- DOE must have an effective system for managing data from numerous sites and providing DOE management with timely and accurate information.



Three Step Study Approach

1. Identified characteristics of a national-level database management system that meets DOE needs.
2. Review of the current database management systems and ongoing improvement initiatives.
3. Needs were compared with existing capabilities to identify shortcomings.



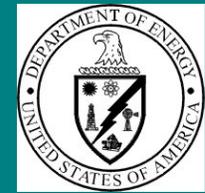
Recommendations

1. Accelerate development and implementation of the Safeguards Information Bridge as a mechanism to provide near-real-time information about the material type, location, and quantities for nuclear materials and sealed sources.
2. Develop and implement a longer-term plan for integrating the current SSA databases (i.e., NMMSS, Safeguards Information Bridge, Local Area Material Accountability System, and Radiological Source Registry Tracking System).
3. Establish clear DOE safeguards and security policy for reporting, tracking, and inventorying sealed sources and evaluating unsealed source materials.



Recommendations (Cont'd)

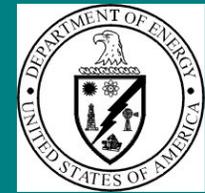
4. Revise DOE Manual 474.1-2A (NMMSS policy) to include provisions for periodic review and assessment of nuclear material holdings by DOE line management, including DOE-owned material at NRC licensee sites.
5. Enhance accounting and reporting practices by updating the nuclear material description codes to reflect current operations and material types, requiring sites to complete monthly reconciliations with NMMSS by the 20th of the following month, addressing discrepancies in reported values for waste between existing databases, and eliminating reports about material in foreign countries that do not provide accurate information to requestors.



Recommendations (Cont'd)



6. Eliminate funding for the International Nuclear Analysis project unless a mission-essential need is identified for the unvalidated information it provides.
7. Revitalize efforts to timely and effectively complete the NMMSS upgrade project by transferring responsibilities for project and contract management to SSA, revising the NMMSS upgrade requirements to include building/material balance area reporting in NMMSS, evaluating the developer, ensuring contractual incentives for developer completion and accountability, and strengthening project reviews and oversight.
8. Establish a DOE/NRC Executive Committee to address issues common to DOE and NRC



MC&A Implementation Activities

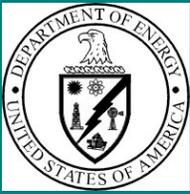
- Five implementation activities have been identified for these eight recommendations.
- Activities and expected outcomes have been assigned to specific individuals.
- Integration of the Office of Security operated databases is the primary concern.
- Policy changes are necessary for full integration of the databases.
- SSA management assumed responsibility for implementation of two of the recommendations.



MC&A Implementation Activities (cont'd)



Activity	Recommendation(s) Addressed	Responsible Individual
Integration Plan	1,2, and 7	Peter Dessaulles (SO-20.3)
Sealed Sources and Unsealed Source Materials	3	Melanie May (SO-20.1)
Materials Management Policy Changes	4	Jim Crabtree (SO-10.1)
Accounting and Reporting Practices	5	Jim Crabtree (SO-10.1)
INA Funding and NRC/DOE Executive Committee	6 and 8	Glenn Podonsky (SP-1)



Integration Plan



- Prepared by SO-20.3 in two steps.
 - Annotated outline transmitted March 4, 2005
 - Final document transmitted April 28, 2005
- Addresses recommendations 1,2, and 7 from SSA study team report.
- Identified desirable system features and assessed current activities against these desired features.



Integration Plan

Comparison Of System Features

System Features	Desired Configuration	FoxPro NMMSS	SIB	RSRT	Upgraded NMMSS
Inventory Frequency	Monthly	Monthly and Quarterly	Quarterly	Annually	Monthly and Quarterly
Transaction Reporting	Yes	Yes	No	No	Yes
Calculated Inventories	Yes	Yes	No	No	Yes
Reporting Level	Building	RIS	Building	Building	RIS
Chemical Form Composition	Use site provided codes	COEI	COEI & some Sites have IDES	Sealed or other sources	COEI
Sealed Sources Uniquely Identified	Yes	Grouped by material and COEI	Grouped by material & COEI some by IDES	Yes	Grouped by material and COEI



Integration Plan

Comparison Of System Features

System Features	Desired Configuration	FoxPro NMMSS	SIB	RSRT	Upgraded NMMSS
Number of Isotopes	13 Accountable plus source materials	13 Accountable	13 Accountable	10 CFR 835 Appendix A >100	13 Accountable
Reconciliation	September Inventory	March and September Inventory	No	No	September Inventory
Access	Remote Controlled VIA User ID Passwords	System Operator	System Operator	WEB with User ID and Password	System Operator
Waste Reporting	Yes	COEI 963 and V RISs	COEI 963	No	COEI 963 and V RISs
Software	Window 2000 Server SQL Server Database	FoxPro for DOS	Windows 2000 Server SQL Server Database	Windows 2000 Server SQL Server Database	Windows 2000 Server SQL Server Database



Integration Plan Purpose and Scope



- The plan documents the strategy for the integration of SO-20.3 databases to meet the current and evolving information needs.
- It also describes the current nuclear material information databases and software, discusses the desired outcome, and presents a strategy for moving from the current to the desired environment.
- Three databases and one software application constitute the scope of the integration effort. They are:
 1. NMMSS
 2. Safeguards Information Bridge (SIB)
 3. Radiological Source Registry and Tracking (RSRT)
 4. Local Area Nuclear Material Accountability Software (LANMAS)



Integration Plan Benefits



- Results in convergence of data systems and a central DOE source for timely and accurate understanding of types of nuclear materials at each DOE site.
- Provides managers with facility-specific and timely information.
- Sites will report required data to single data entry point.
- Improves data quality and timeliness.



Integration Plan

Underlying Principles and Goals

- Integration will result in a system which:
 - Enables threat response and emergency management associated with DOE inventories of nuclear materials.
 - Assures and enhances nuclear materials safeguards.
- Assure adherence to existing national policy.
- Assure adherence to, and support for, international agreements and treaties.
- Assure full compliance with IAEA protocols and code of conduct.
- Assure the security of data.



Integration Plan Objectives



- Implement data management capabilities that enable more efficient threat response and emergency management.
- Eliminate reporting redundancy to multiple data systems.
- Improve data quality through enhanced accuracy, timeliness, and detail.
- Ensure a consistent and efficient approach to safeguards data management and reporting through increased coordination with the NRC
- Improve data accessibility for personnel with appropriate need-to-know.



Integration Plan Considerations and Assumptions

- Implementation of the plan assumes FY 2005 funding levels.
- Implementation will require new and/or updated regulations, policy, and directives.
- Joint reporting requirements need to be established between DOE and NRC.
- Monthly inventory reporting will be requested of program offices and sites.
- Requested data is currently available in existing site systems.



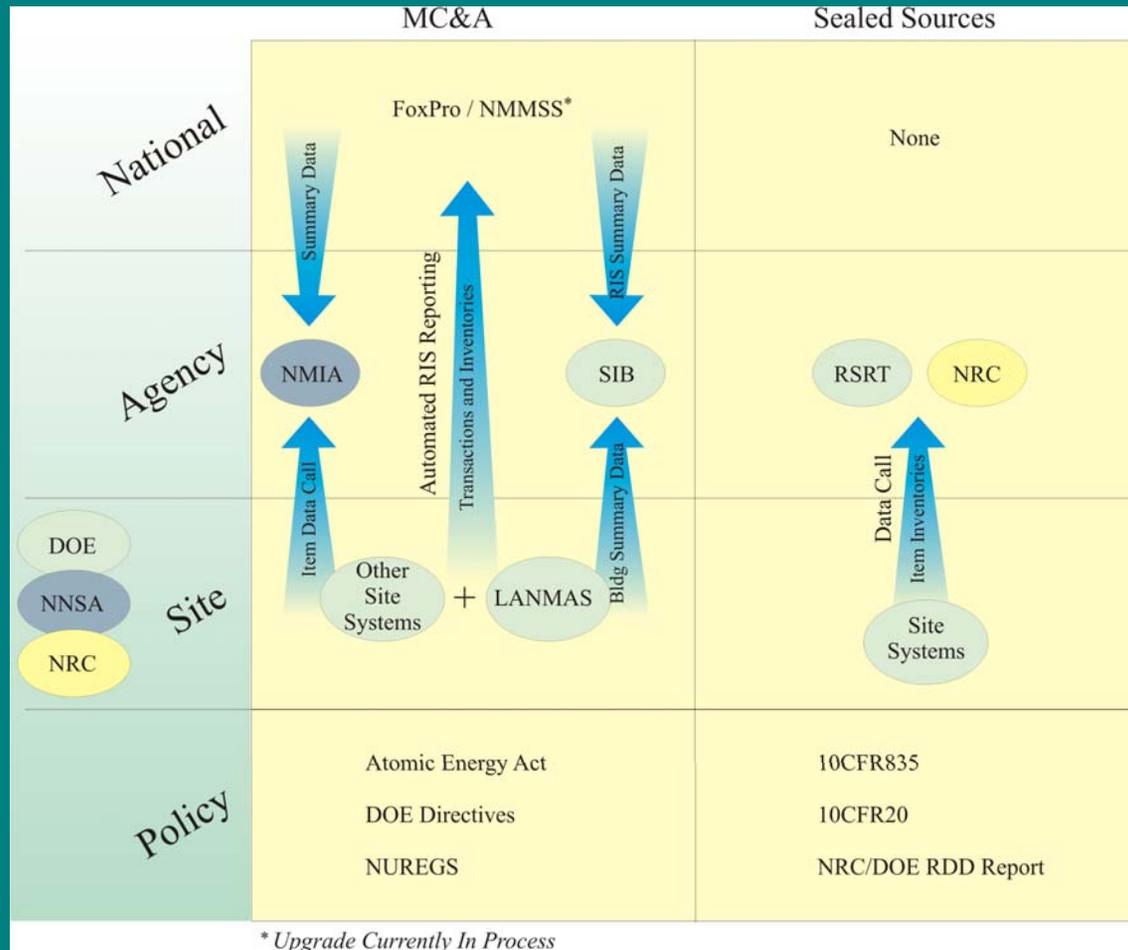
Integration Plan

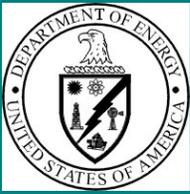
Constraints and Impediments

- Moving from current configuration to the desired configuration will occur in stages.
- Acceptance of integration approach by programs and sites that must provide detailed data beyond what is currently reported to NMMSS and other SO systems.
- National Source Tracking System (NSTS) ability to meet all DOE requirements.



Integration Plan Current Configuration





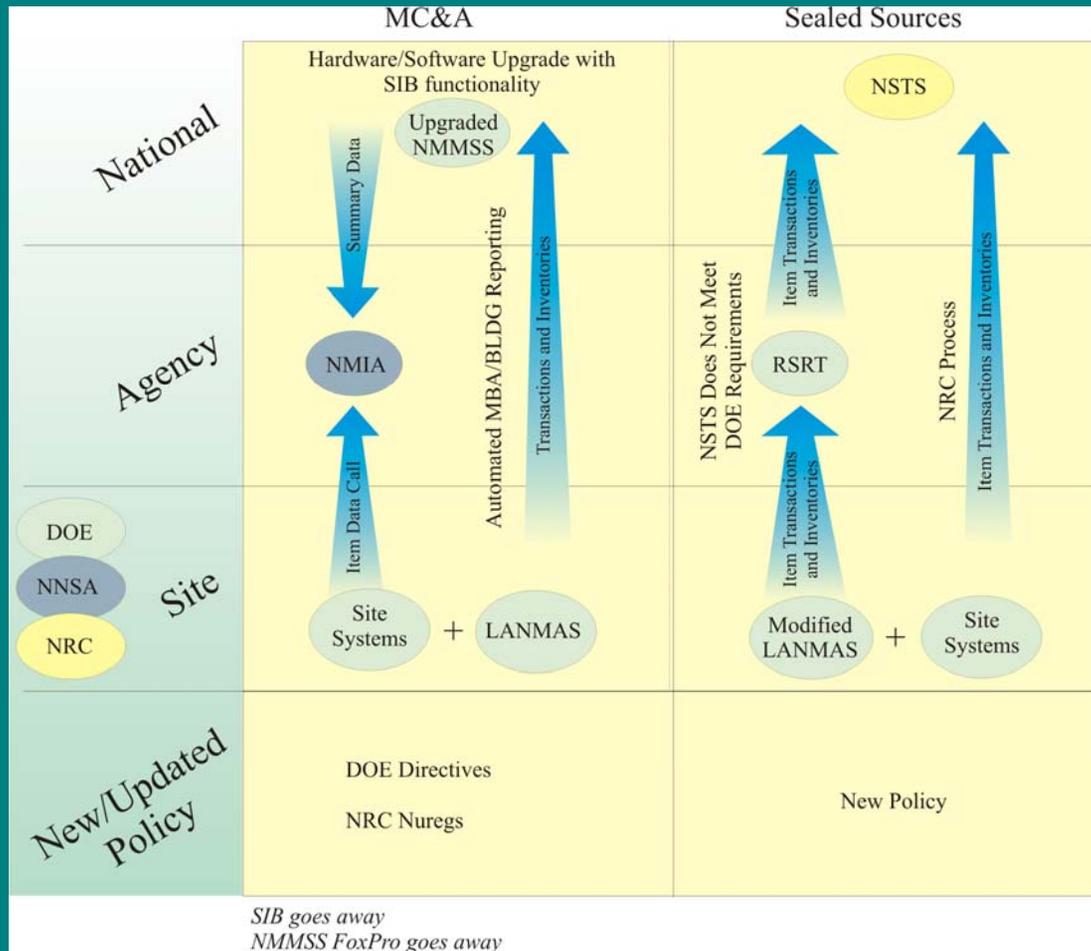
Integration Plan Current Configuration



- Three stand-alone relational databases.
 1. NMMSS: the national level system (DOE and NRC) for routine reporting of nuclear materials transactions and inventories by predetermined site reporting entities.
 2. SIB: DOE agency-level prototype database of nuclear materials inventories by site and building location.
 3. RSRT: DOE agency-level prototype database of radiological sealed source inventories by site and building/room location.
- LANMAS: A software application available for integration into the local site MC&A system.



Integration Plan Desired Configuration





Integration Plan Desired Configuration



- The Upgraded NMMSS will be the national-level system (inputs, processing, reporting) for routine reporting of nuclear materials transactions by RIS and inventories by building/facility.
- The NSTS will be the national-level system for routine reporting of sealed source transactions and inventories.



Integration Plan

Staged Changes To Components

Component	CY 2005	CY 2006	CY 2007	CY 2008
FoxPro NMMSS	<ul style="list-style-type: none">•Modify to accept building/facility level data•Develop capability to export data on monthly basis to SIB	<ul style="list-style-type: none">•NMMSS/Site reconciliation change from semi-annual to annual on owner and material type		<ul style="list-style-type: none">•Discontinue FoxPro and move to NMMSS upgrade
NMMSS Upgrade	<ul style="list-style-type: none">•Integrate SIB functions e.g. building/facility level data into requirements	<ul style="list-style-type: none">•Begin to incorporate FoxPro Changes•Investigate feasibility of implementing web server capability	<ul style="list-style-type: none">•Investigate development of automated reconciliation software•Investigate methods to improve accessibility to NMMSS data•Update/supplement the NMMSS COEI's with more meaningful form descriptions•If NSTS does not meet DOE requirements consider modification for sealed source reporting and export data to NSTS	Replace FoxPro NMMSS as the national system



Integration Plan

Staged Changes To Components

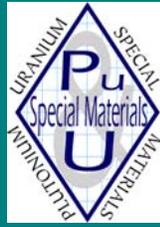


Component	CY 2005	CY 2006	CY 2007	CY 2008
SIB	<ul style="list-style-type: none"> •Modify to accept building/facility data exported from FoxPro NMMSS •Incorporate sealed source data from RSRT 	<ul style="list-style-type: none"> •Link SIB to a Global Information System (GIS) display capability 	<ul style="list-style-type: none"> •Incorporate SIB into NMMSS and continue the SIB as a data analysis and display tool using data exported from the upgraded NMMSS 	
RSRT	<ul style="list-style-type: none"> •Continue Annual Data Call 	<ul style="list-style-type: none"> •Continue Annual Data Call •If NSTS meets DOE requirements discontinue RSRT 	<ul style="list-style-type: none"> •If NSTS does not meet DOE requirements consider RSRT modification for transaction reporting and export data to NSTS 	<ul style="list-style-type: none"> •If NSTS meets DOE requirements discontinue
LANMAS	<ul style="list-style-type: none"> •Modify to report building/facility level data to NMMSS 	<ul style="list-style-type: none"> •Modify to collect site sealed source data 		



Integration Plan Strategies For Effecting Change

- FoxPro NMMSS
 - Modify to accept building/facility level data.
 - Change site and NMMSS reconciliation process
 - Change reconciliation frequency from semi-annual to annual
 - Change to reconcile (and Material Balance Reporting) only on owner and material type
 - SO will investigate the elimination of certain material types in NMMSS reporting requirements.
 - Develop the capability to export data on a monthly basis to the SIB.
 - Upon completion of parallel testing and successful acceptance testing of the upgraded NMMSS discontinue.



Integration Plan Strategies For Effecting Change

- NMMSS Upgrade
 - Investigate development of automated tools to assist the site reconciliation process.
 - Investigate methods to improve accessibility to NMMSS data.
 - Include the changes to the NMMSS FoxPro.
 - Evaluate the feasibility of implementing web server capability to NMMSS upgrade.
 - Update/supplement the NMMSS COEI's with more meaningful material form descriptions
 - Further unify DOE and NRC requirements for reporting to the upgraded NMMSS.



Integration Plan Strategies For Effecting Change

- SIB
 - Transition SIB from a prototype to a production system through integrating SIB functions into the NMMSS upgrade.
 - Modify to accept site building/facility data exported from the FoxPro NMMSS.
 - Link to a Global Information System (GIS)
 - Incorporate sealed source data from RSRT
 - In the long-term transition SIB to a data analysis and display tool only.



Integration Plan Strategies For Effecting Change



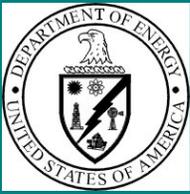
- RSRT
 - Through CY 2006 continue the annual data call as the method of registering sealed source inventories at DOE facilities.
 - Future actions are dependent upon emerging requirements within the DOE and the NRC-led development of the NSTS.
 - Two possible outcomes:
 - DOE sites will report directly to the NSTS and RSRT will be discontinued, or
 - DOE will modify the RSRT or incorporate requirements into the upgraded NMMSS.



Integration Plan Strategies For Effecting Change



- LANMAS
 - SO-20.3 will continue with software development, installation, and training
 - Modify as necessary to report building/facility data to NMMSS.
 - Modify as necessary to report sealed source data to DOE agency-level system.



Implementation Plan Summary



- When successfully implemented, this plan will result in a configuration that will achieve better efficiency and effectiveness in our management of nuclear and radionuclide materials information.
- Information will be reported by DOE sites to a single entity by location detail and attributes that assure timely and accurate understanding of the types and descriptions of nuclear materials in a facility.
- The information will be readily available to personnel with proper authority via controlled and responsive procedures.