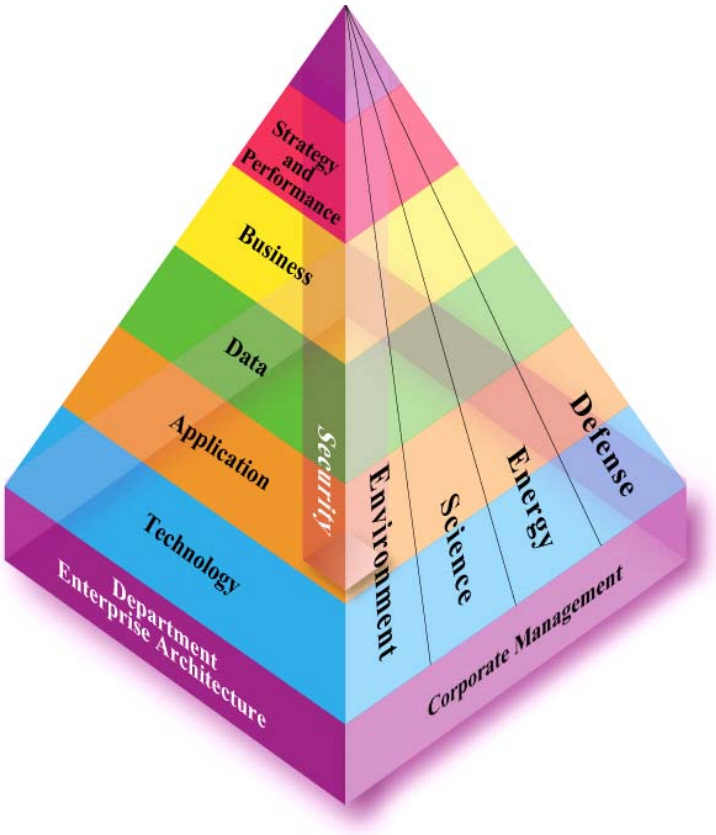
# United States Department of Energy Enterprise Architecture

# DOE Transition Strategy and Sequencing Plan

## Volume 2 – The 2008 Annual Report

### Enterprise Architecture and the Management of the Department of Energy's Most Efficient Organization

Version 3.0
**February 27, 2008**



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# 1 Introduction

The DOE Transition Strategy and Sequencing Plan (TS&SP) Volume 2, ***DOE Investment and Performance Details*** is a continuation from Volume 1, ***DOE Segment Architectures and Transition Strategies***.

In Volume 1, the discussion covers:

- How the DOE EA Program works
- What constitutes the DOE Target EA Vision
- The DOE Segment Approach
- The FY 2008 Segments
- The DOE Transition Strategies
- The Segment Sequencing Plans

In this next volume of the 2008 Annual Report, the topics that are discussed include:

- EA and the Management of DOE's Most Efficient Organization (MEO)
- How DOE Used EA to Assess and Approve BY 2009 Investments
- The range of DOE Major Investment projects
- The Performance Goals and Measures associated with the DOE Major Investments
- The DOE Sequencing Plan, including milestones, for the agency's Major Investments
- Examples of EA Use at DOE

Figure 1 - The Overall Structure of the TS&SP is a duplicate of an earlier diagram in Volume 1, and is provided here again only as a convenient reminder and reference of how the various parts of the TS&SP fit together

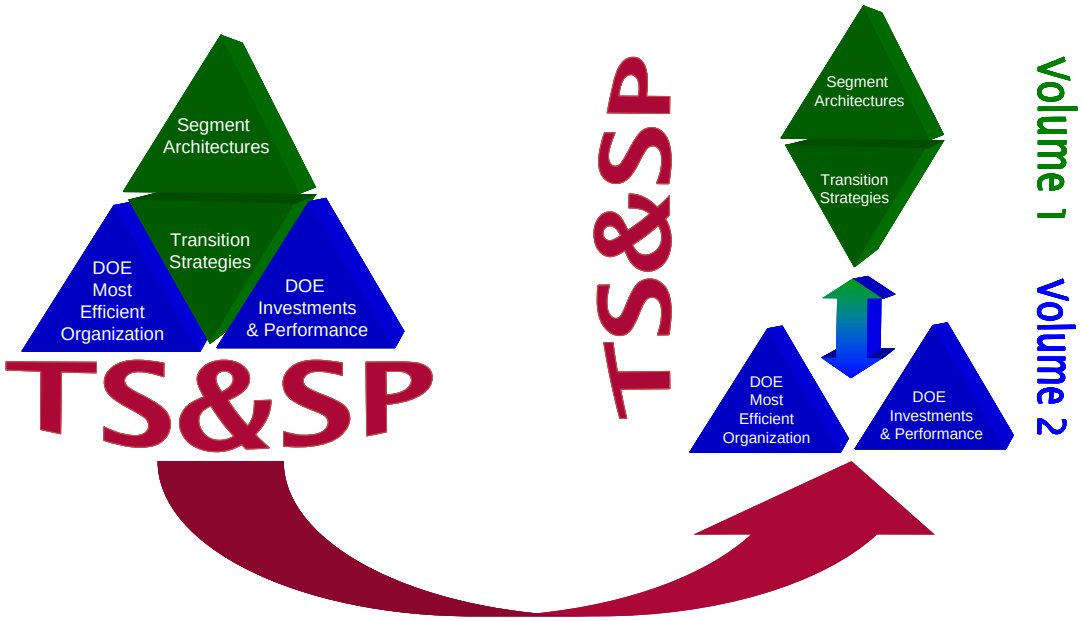



**Figure 1 - The Overall Structure of the TS&SP**

# 2 Enterprise Architecture and the Management of the Department of Energy's Most Efficient Organization (MEO)

The MEO as part of the DOE Transition Strategy was outlined in Section 5.2.3 in Volume 1 of this TS&SP. As part of providing an update on the MEO efforts as briefly described that, in September, 2006, DOE's IM-40 conducted a preliminary ITIL assessment and provided Foundation training for a limited number of employees. The assessment indicated that OCIO operations were at the Stage 1 Initial maturity level for all ITIL processes except for Change Management and Incident Management. These last two processes were assessed at the Step 2 Repeatable maturity level. In January, 2008, an analysis was also undertaken to identify ISO 20000 consultant resources that might be able to guide MEO operations through the entire certification process (an 18-24 month process). A contract award is expected in March 2008 to accomplish this as part fulfilling the MEO's part of the DOE Transition Strategy to migrate to the DOE Target EA Vision.

Also, as part of establishing an architectural Baseline, the topology of the DOE infrastructure, DOE Enterprise Network (DOEnet), has been documented in detail in order to support the IPv6 transition. The overall picture is the DOEnet set of infrastructure relationships without connectivities as shown below in Figure 2 – DOE Enterprise Network as of June 1, 2007.

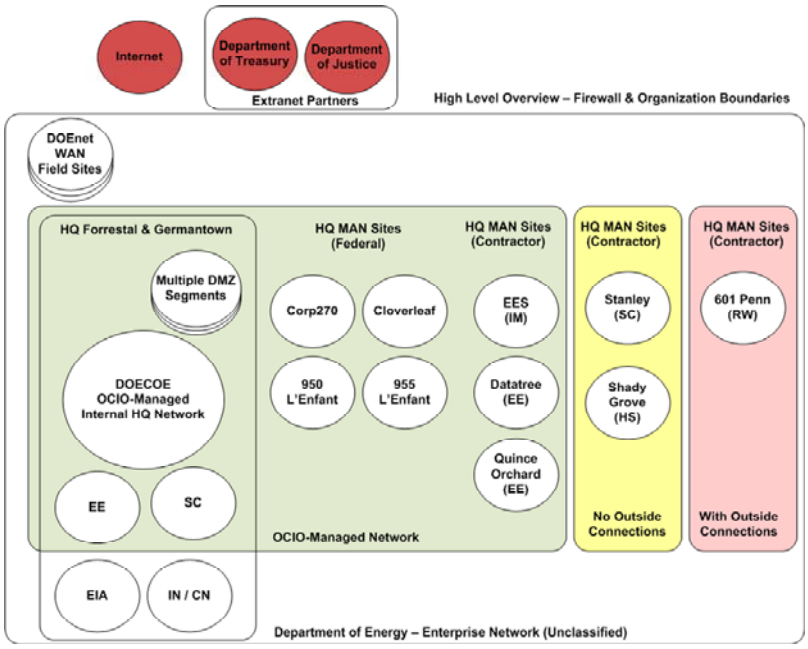



**Figure 2 - DOE Enterprise Network as of June 1, 2007**

## *2.1 MEO and the Department of Energy's EA Transition Strategy to fulfill the Trusted Internet Connections (TIC) Initiative*

The Office of Management and Budget (OMB) Memorandum M-08-05 directs all Federal Civilian Agencies to implement the Trusted Internet Connections (TIC) initiative. The TIC aims to improve the security posture of the Federal civilian agencies' by reducing the external/Internet connections.

The Department of Energy recognizes the criticality of TIC and the service enhancement to DOENET. The department is aware of the risks to the TIC solution and is ensuring that implementation strategies include risk mitigation. DOE will ensure all Enterprise network traffic will be placed on the DOENET. DOENET will support all DOE Federal staff and their supporting contractors.

DOE will continue to ensure that the multi-national, collaborative, research networks operated by the DOE National Laboratories are protected while continuing use of the networks by outsiders for Research & Development. **DOENET with TIC services will consist of the following:**

- **DOENET will consist of the network infrastructure and the MEO Common Operating Environment (COE) (servers, help desks, desktop support, etc.) while providing TIC enhancement capabilities.**
- **The TIC Service enhancements will run on top of DOENET.**
- **Small collections of federal staff and their direct support contractors who are located at sites served by ESnet will be transported via virtual, authenticated connections to the DOENET NOC locations as a phased approach and until such time as they procure direct links to DOENET.**
- **DOENET will be compliant with the OMB TIC requirements, e.g. all traffic that enters or leaves the DOENET accreditation boundary will be monitored.**

### 2.1.1 DOE's Strategic Goal for Complying with the TIC Initiative

The Department of Energy (DOE) has developed a TIC-compliant architecture, the Secure Energy Enterprise System (SEES) that addresses the various mission needs of the department which includes open science, weapons design, and day-to-day business. The SEES Segment Architecture will become the agancy's fourth Featured Segment beginning with the 2nd calendar quarter of 2008 as shown below in Figure 3 – DOE Featured Segments.

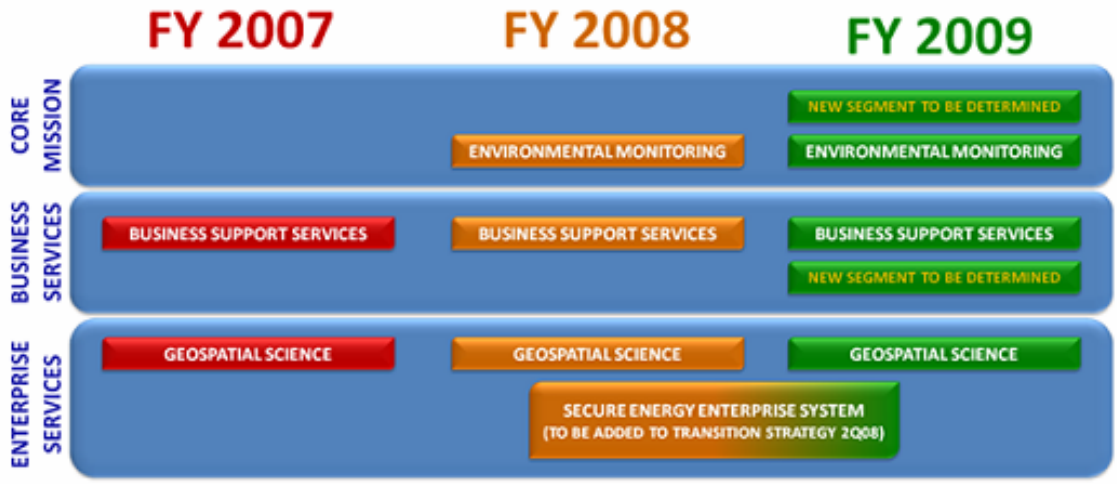



**Figure 3 - DOE Featured Segments**

The SEES TIC compliant architecture is comprised of the following:

- Network Operation Centers (NOC's) - There will be (minimum) two NOC's for providing access to the Internet: Enterprise Service Center – EAST (ESC-EAST) and Enterprise Service Center – WEST (ESC-WEST). The term NOC will be used to reference both ESC-EAST and ESC-WEST.
- Security Operation Center (SOC)– The SOC will monitor, collect and analyze network data in relations to cyber security events and threats.
- Intrusion Detection System (IDS) – Einstein IDS (DHS approved) and DOE IDS (DOE approved) are sensors used to collect network data for analysis of cyber security events and threats to the department.

### 2.1.2 DOE's Network Configuration for Complying with the TIC Initiative

The network configuration of DOE logically and physically separates the research and collaboration networks, preserves the diverse ongoing DOE missions, and establishes an infrastructure that allows the DOE federal employees and supporting contractors to conduct non-research business while being TIC compliant.

#### 2.1.2.1 ESNet

The ESNet's primary mission is to enable large-scale science and depends on:

- The sharing of massive amounts of data
- Supporting thousands of collaborators world-wide
- The distribution of data processes
- A distributed data management system
- A distributed simulation, visualization, and computation steering, and
- The collaboration with the US, international research, and education community

ESNet will include expanded DOE IDS implementations especially at ESNet-serviced locations that contain HIGH and MODERATE level data. In addition, information from these IDS will feed into the DOE SOC for cyber event and threat analysis.

#### 2.1.2.2 DOENET

DOENET currently utilizes many external/Internet connections to DOE sites and laboratories. Although DOENET is ubiquitous within DOE, not all DOE Federal employees are currently connected to this infrastructure. In many instances, Federal employees at who reside at DOE laboratories use the laboratory infrastructure to conduct Federal business. Prior to the TIC mandate an initiative to migrate more federal employees to DOENET was underway; this initiative is further enhanced and more comprehensive because of TIC.

The distribution of DOE Federal employees and supporting contractor staff exist in several different configurations. In some cases, Federal employees and supporting contractor staff are housed in a single location to provide oversight to a national laboratory; in other cases, these Federal employees and supporting contractor staff are interspersed throughout the contractor/laboratory facilities. With such a wide distribution and divergent connection solutions, the TIC architecture has identified five components that describe this distribution and adaptation to the TIC-compliant architecture as shown in Figure 3.

# 3 How DOE Used EA to Assess and Approve BY 2009 Investments

The alignment of investments with the EA under Capital Planning and Investment Control (CPIC) consideration is essential in the integrated governance process that was followed to evaluate investment proposals for BY 2009. The determination was made whether the funding requests were appropriate and balanced for DOE with respect to its EA and its Strategic Plan.

To do this, the scoring criteria used for assessing the alignment of these spending proposals to the EA (and actually this is done directly to the FEA BRM and SRM) were the following:

1. **EA Maturity**

   ***How much of FEA models and processes are useful to program managers?***

2. **Inter-Agency Initiatives**

   ***How is the investment leveraging components outside of DOE?***

3. **Investment Usage of EA Components**

   ***To what degree are components aligned to DOE's EA (Energy Information Technical Architecture)?***

4. **Strength of the Investment's Alignment to a DOE Segment Architecture**

   ***How complete is the investment's alignment to a DOE Segment Architecture and how much of the investment remains an "investment-at-large" for DOE and not supporting any particular DOE Segment Architecture?***

5. **Duplication and Collaboration Opportunities**

   ***Are other investments fulfilling similar functions and/or Services?***

Figure 4 – BY 2009 Major Investments by BRM and SRM shows the DOE investment breakdown after using the criteria above for EA alignment and subsequent CPIC approval for the expenditures. The array of where investments are currently being made at DOE relative to the FEA as the reference model is illustrated in the matrix in that figure.

Even at a glance, the dispersion of DOE investments in the matrix appears to be fairly even. This is the consequence of using the EA at DOE to influence and shape CPIC decisions and avoiding subjective biases toward and unbalanced concentrations of just a few projects at the expense of many others.

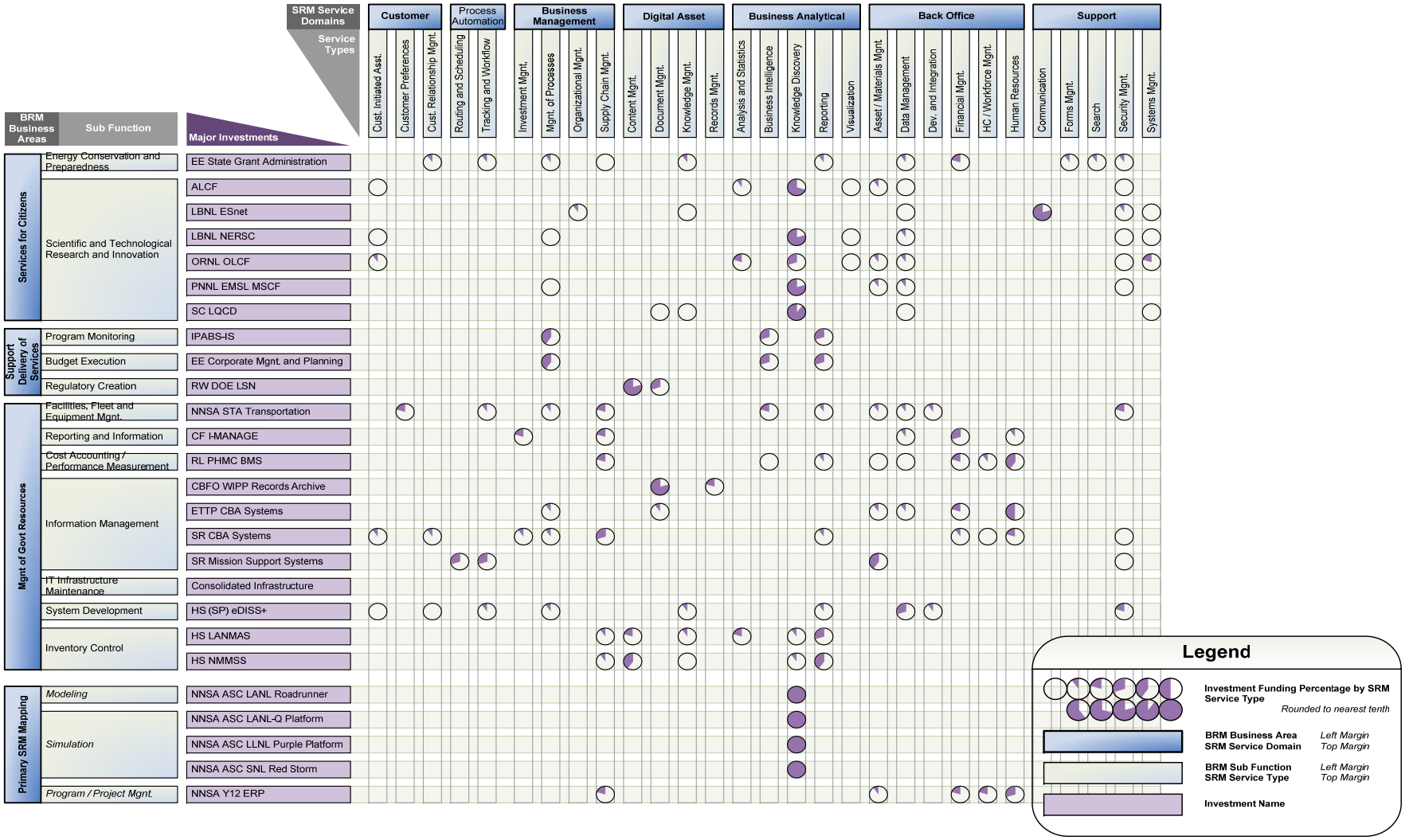



**Figure 4 - BY 2009 Major Investments by BRM and SRM**

# 4 BY 2009 Investment Portfolio by PSO

The DOE BY 2009 Investment Projects have been developed and approved within the guidance of the DOE EA with reference to the FEA BRM and SRM. The financial data reported here was taken from the Budget Year 2009 passback reconciliation submitted to OMB on 1/7/08.

***NOTE: The alignment of Investments with Segments is discussed in Section 7.4 – DOE's BY 2009 Investments Supporting FY 2008 Segments in Volume 1 – DOE Segment Architectures and Transition Strateg***

## *4.1 BY 2009 Investment Portfolio by DOE Major Business Area*

Following the 2007 identification of segment architectures for DOE, DOE continued to develop and bring maturity to its architecture this year through the refinement and alignment of its BY 2009 Total Investment Portfolio to the DOE EA and the FEA BRM and SRM. To accomplish this with a suitable degree of consistency, DOE also realigned its architecture under three major business areas: Core Mission, Business Services, and Enterprise Services. These changes are a result of new guidance and reporting requirements from OMB and an effort by the Department of Energy to move toward a more modular and strategically-aligned architecture.

The Department's segment architecture approach to building out the EA incrementally in manageable, value-driven segments is underway. This 2008 TS&SP is built around the sequencing of investment projects for development and implementation work to make an effective and efficient migration to the DOE Target Architecture. Future, updates he execution of the TS&SP will result in the development of a vision for each segment and detailed implementation plan, within the context of the overall EA. Central to this management of the transformational initiatives driving towards our target strategic direction is the focus across the major business areas of Core Mission Area, Business Services, and Enterprise Services as described below and incorporating the OMB definition of the segment type for consistency across the government portfolio.

- **Core Mission Area**
- **Business Services Area**
- **Enterprise Services Area**

The Financial Update for this 2008 Annual Report breaks out the BY 2009 investments according to how these three business area categories map to the FEA BRM and SRM. The financial data reported here was taken from the Budget Year 2009 passback reconciliation

submitted to OMB on 1/7/08. The expectation ordinarily would be that the Core Mission Area and the Business Service Area investments would align to the BRM, while those for the Enterprise Service Area would aligned with the SRM. However, as shown in Figure 4 - Distribution of BY 2009 Investment Sponsors by DOE Business Areas and FEA BRM-SRM, the sponsors of investment projects cross-over quite a bit between those two domains[1].

### 4.1.1 Core Mission Area Profile

The Core Mission Area represents a categorization of the unique services executed at DOE supporting the strategic mission and goals of DOE, specifically related to services and products provided to external and/or internal business stakeholders. These unique services are those that define the mission or purpose of the agency as defined by the agency business managers. The Core Mission Area has been established through legislation, executive direction, strategic plans, budgets and other direction setting actions. Each service so categorized consists of multiple functions and sub-functions.

### 4.1.2 Business Service Area Profile

The Business Service Area is a strategic categorization of DOE's work, organized around a specific aspect of its business mission to deliver a related set of services or products to external and/or internal business stakeholders. These are common or shared business services supporting the Core Mission Areas. Business services are defined by the agency in alignment with the FEA's BRM and SRM, and include the foundational mechanisms and back office services used to achieve the purpose of the agency. The Business Services have been established through legislation, executive direction, strategic plans, budgets and other direction setting actions. Each service so categorized consists of multiple functions and sub-functions similar to the Core Mission Area category.

### 4.1.3 Enterprise Service Area Profile

The Enterprise Service Area is a strategic categorization of Information Technology services at DOE, supporting both the Core Mission and Business Services Areas delivering IT services to external and/or internal business stakeholders. These are common or shared IT services supporting core mission and business service areas. Enterprise services are defined by the agency in alignment with the FEA's BRM and SRM, and include the applications and service components used to achieve the purpose of the agency. Enterprise Services are established through legislation, executive direction, strategic plans, budgets and other direction setting actions. Each service consists of multiple functions and sub-functions in the same way as those in both the Core Mission Area and Business Service Area.

[1] Although in the DOE 1Q08 OMB Milestone Update, there was the expectation that these financial results for BY 2009 would also be broken out by our active segment architectures as well where applicable, the better path for 2008 proved to be focusing on Major Investments by the PSO's instead. As time goes on from 2008, DOE will provide similar investment discussions in terms of its active segments.

### 4.1.4 DOE BY 2009 Investment Portfolio by BRM/SRM/Sub-Function and Major Business Area

Figure 5 – Distribution of BY 2009 Major Investment Sponsors by DOE Business Areas and FEA BRM-SRM shows that DOE's IT Investment Portfolio provides extensive support to its Core Mission Areas while also giving the Business Service Areas and Enterprise Service Areas assistance as well.

| DOE BY 2009 Major Investment Projects | Core Mission Area | | | | Business Service Area | | | | | | | | | | Enterprise Service Area | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Defense | Energy | Environment | Science | Administrative Management | Controls and Oversight | Financial Assistance | Financial Management | Human Resource Management | Internal Risk Management & Mitigation | Planning and Resource Allocation | Public Affairs | Regulatory Development | Supply Chain Management & Procurement | Geospatial Science | Information and Technology Management |
| **Primary BRM Activitiy Mappings** | | | | | | | | | | | | | | | | |
| **Primary BRM Activitiy #** | **Primary BRM Activity Name** | | | | | | | | | | | | | | | |
| 103 | Defense & National Security | | | | | | | | | | | | | | | |
| 104 | Disaster Management | | | | | | | | | | | | | | | |
| 106 | Education | | | | | | | | | | | | | | | |
| 107 | Energy | | | | | | | | | | | | | | | |
| 108 | Environmental Management | | | | | | | | | | | | | | | |
| 109 | General Science and Innovation | | | | | | | | | | | | | | | |
| 111 | Homeland Security | | | | | | | | | | | | | | | |
| 113 | Intelligence Operations | | | | | | | | | | | | | | | |
| 115 | Law Enforcement | | | | | | | | | | | | | | | |
| 119 | Workforce Management | | | | | | | | | | | | | | | |
| 301 | Controls and Oversight | | | | | | | | | | | | | | | |
| 302 | Internal Risk Management and Mitigation | | | | | | | | | | | | | | | |
| 304 | Planning and Budget | | | | | | | | | | | | | | | |
| 305 | Public Affairs | | | | | | | | | | | | | | | |
| 306 | Regulatory Development | | | | | | | | | | | | | | | |
| 307 | Revenue Collection | | | | | | | | | | | | | | | |
| 401 | Administrative Management | | | | | | | | | | | | | | | |
| 402 | Financial Management | | | | | | | | | | | | | | | |
| 403 | Human Resource Management | | | | | | | | | | | | | | | |
| 404 | Information and Technology Management | | | | | | | | | | | | | | | |
| 405 | Supply Chain Management | | | | | | | | | | | | | | | |
| **Primary SRM Activitiy Mappings** | | | | | | | | | | | | | | | | |
| **Primary SRM Activitiy #** | **Primary SRM Activity Name** | | | | | | | | | | | | | | | |
| 103 | Defense & National Security | | | | | | | | | | | | | | | |
| 721 | Management of Process | | | | | | | | | | | | | | | |
| 731 | Content Management | | | | | | | | | | | | | | | |
| 733 | Knowledge Management | | | | | | | | | | | | | | | |
| 741 | Analysis and Statistics | | | | | | | | | | | | | | | |
| 743 | Knowledge Discovery | | | | | | | | | | | | | | | |
| 745 | Reporting | | | | | | | | | | | | | | | |
| 751 | Data Management | | | | | | | | | | | | | | | |
| 752 | Human Resources | | | | | | | | | | | | | | | |
| 753 | Financial Management | | | | | | | | | | | | | | | |
| 754 | Assets & Materials Management | | | | | | | | | | | | | | | |
| 761 | Securiy Management | | | | | | | | | | | | | | | |
| 765 | Systems Management | | | | | | | | | | | | | | | |
| **Sub-Function BRM Mappings** | | | | | | | | | | | | | | | | |
| **Primary BRM Activitiy #** | **Sub Fctn BRM Activitiy #** | **Primary BRM Activity Name** | **Sub-Function BRM Activity Name** | | | | | | | | | | | | | |
| 107 | 022 | Energy | Energy Production | | | | | | | | | | | | | |
| 108 | 024 | Environmental Management | Environmental Remediation | | | | | | | | | | | | | |
| 109 | 026 | General Science and Innovation | Scientific & Tech Rsch & Innovation | | | | | | | | | | | | | |
| 301 | 093 | Controls and Oversight | Program Monitoring | | | | | | | | | | | | | |
| 401 | 119 | Administrative Management | Facilities, Fleet & Equipment Management | | | | | | | | | | | | | |
| 401 | 121 | Administrative Management | Security Management | | | | | | | | | | | | | |
| 402 | 124 | Financial Management | Accounting | | | | | | | | | | | | | |
| 402 | 129 | Financial Management | Reporting and Information | | | | | | | | | | | | | |
| 404 | 138 | Information and Technology Management | System Maintenance | | | | | | | | | | | | | |
| 404 | 139 | Information and Technology Management | IT Infrastructure Maintenance | | | | | | | | | | | | | |
| 404 | 140 | Information and Technology Management | Information Security | | | | | | | | | | | | | |
| 404 | 141 | Information and Technology Management | Record Retention | | | | | | | | | | | | | |
| 404 | 142 | Information and Technology Management | Information Management | | | | | | | | | | | | | |
| 405 | 143 | Supply Chain Management | Goods Acquisition | | | | | | | | | | | | | |
| 403 | 255 | Human Resource Management | Employee Performance Management | | | | | | | | | | | | | |

**Figure 5 - Distribution of BY 2009 Major Investment Sponsors by DOE Business Areas and FEA BRM-SRM**
(Financial data was taken from the Budget Year 2009 passback reconciliation submitted to OMB 1/7/08)

## *4.2 BY 2009 Major DME Investments*

As previously discussed, the DOE BY 2009 Major Investment projects that have DME that have yet to be completed and/or deployed represent "new" initiatives. There are 13 of these projects. The Sequencing Plan itself is an orchestration of the key milestones that have been specified for these 13 projects from this timeframe to that last current DME milestone.

Each of these 13 projects is profiled in their own sections that follow. In those descriptions are the reasons why they are so important for DOE as well as for the other things such as the President's Management Agenda along with the E-Gov Initiatives.

### 4.2.1 Chief Financial Officer: CF Integrated Management Navigation System (I-MANAGE)

The acquisition and implementation of the two final I-MANAGE systems (STRIPES and SBS) in FY 2008 and FY 2009 by the DOE Chief Financial Officer (CFO), will unify several disparate systems into one architecture which can share common data, thus eliminating redundancies and discrepancies by completing the replacement of multiple, stand-alone corporate business management systems maintained by DOE program offices with a single integrated DOE umbrella system.

A fully implemented I-MANAGE program will support the accomplishment of the Department's Strategic theme "Management Excellence" by standardizing and integrating administrative

**Figure 3 - BY 2009 DOE Major Investments with DME for Sequencing as Transition Projects**

processes throughout DOE. The Integrated Management Navigation System (I-MANAGE) Program was launched in 2003. I-MANAGE is the Department's risk adjusted solution for managing enterprise-wide systems initiatives to achieve improved financial and business efficiencies, integrate budget and performance, improve decision making, enhance security posture, and expand electronic government in support of the President's Management Agenda. The I-MANAGE Program incorporates enterprise-wide projects from three collaborating headquarters organizations, Office of the Chief Financial Officer, Office of Human Capital Resources, and the Office of Management. The major project investments of I-MANAGE consist of: Standard Accounting and Reporting System (STARS), I-MANAGE Data Warehouse (IDW), Corporate Human Resources Information System (CHRIS), Standard Budget System (SBS), and Strategic Integrated Procurement Enterprise System (STRIPES). SBS and STRIPES are in the acquisition phase. STARS and IDW are mixed lifecycle, and CHRIS is steady state. Operational Analyses were done on CHRIS, STARS, and IDW.

### 4.2.2 Chief Information Officer: Consolidated Infrastructure, Office Automation, and Telecommunications Program

The DOE Chief Information Officer (CIO) is responsible for the Consolidated Infrastructure investment which is made up of a portfolio of over 380 infrastructure sub-investments that support DOE's business and mission processes, DOE strategic theme 5 Management Excellence Goal 5.3 Infrastructure, DOE's IT Vision, IT A-76, and the Infrastructure Optimization (IOI) Line of Business (LOB). To accomplish this, DOE's infrastructure provides in six areas:

1. Telecommunication and Networks - TN (DATA),
2. Office Automation - OA,
3. Telephony - TP (Voice),
4. Cyber Security - (CS),
5. Application Hosting Environment - (AHE), and
6. Enterprise Collaboration - (EC).

The Department of Energy relies on and manages the Information Technology services provided through these infrastructure investments to enhance Mission Support and operating efficiencies, and meet required service levels. DOE's IT Vision aims to affect governance and processes in order to provide access to modern, reliable, and secure IT infrastructure and systems to support and enhance DOE's mission in the 21st century. Our IT strategic goals are based on three basic requirements: simple access, effective management, and strengthened security.

This Consolidated Infrastructure investment supports the President's Management Agenda E-Gov goal by supplying digital technologies to transform government operations in order to improve effectiveness, efficiency, and service delivery. Consolidated Infrastructure is the foundation required for DOE to perform basic E-Gov business functions.

- TN and TP address the network / communications services both internal and external.
- OA addresses the client services which are associated with seat management.
- CS addresses the services required to maintain infrastructure integrity.
- EC integrates people and processes across the infrastructure.

The infrastructure supports about 15,000 users via DOE IT A-76 contract and over 90,000 users located in DOE filed and site locations.

### 4.2.3 Energy Efficiency & Renewable Energy: EE Corporate Management and Planning System

The Energy Efficiency & Renewable Energy (EERE) role is to improve and provide a comprehensive capability for EERE program managers and staff to easily make informed funding decisions on RD&D investments, track all R&D activities; monitor research progress; and quantify impacts, benefits, and costs to support DOE strategic goals and the President's Management Agenda. This ready access will better support the decision-making process. Enhanced capabilities and analysis of data can provide EERE managers with appropriate information when they need to know it, which allows for better oversight of federally-invested dollars and gauging RD&D performance for all of EERE's RD&D investments.

The FY2009 DME efforts for the Corporate [Management and] Planning System (CPS) involve collecting mission-oriented technical and costing information from field stakeholders including the EERE Project Management Center and States. Additionally, CPS will interface with future DOE corporate systems (STRIPES and SBS) to collect relevant mission information to complement and fulfill the information needs of EERE managers. EERE personnel will work with I-Manage teams during FY2008 to facilitate this interaction. CPS process and workflow will also be improved, utilizing findings from A-123 modeling and analysis efforts.

CPS is critical for supporting EERE's strategic management framework and is responsive to the goals and objectives within EERE's Strategic Plan commitment to change the way it does business and support the objectives of its 10 mission programs and business administration offices. This investment meets several primary PMA Government Reform Objectives to be results oriented, link budget and management decisions to performance, ensure financial accountability, and eliminate redundant systems through consolidation.

In 2004, EERE brought CPS online to replace four similar, non-interfacing, sector-specific budget execution systems (OPTIS, OITIS, BRUTIS, and Program Explorer), bringing business operations under one platform, and bolstering its goal for "one way of doing business." To fulfill EERE program mission information needs, CPS evolved to interface with field project management systems and corporate financial reporting systems. With CPS successfully closing EERE's performance gaps, OE and FE share this capability, demonstrating collaboration and re-use within the Energy LOB. CPS technology conforms to the DOE Information Technology Architecture and TRM and data elements are mapped to EA repository DRM. CPS is consistent with DOE's E-Government strategy.

### 4.2.4 Environmental Management: CBFO Waste Isolation Pilot Plant (WIPP) Records Archive (WRA)

For Environmental Management, this project began with Congressional Earmark Funding for FY05-08. FY09 is the first OMB funding request. The Carlsbad Field Office (CBFO) has a 115-year mission to accept, store, dispose, and monitor all defense-generated transuranic (TRU) waste. The custodial responsibility for records related to this waste, including its creation, storage, and disposition, has been transferred to the CBFO. Records management (RM) is required by U.S. Code 44 and Code of Federal Regulations Part 36.

Records of waste shipped to the CBFO Waste Isolation Pilot Plant (WIPP) for disposal had been maintained at the generator sites. As these sites close, chain of custody and data integrity are jeopardized. The National Archives and Records Administration (NARA) is responsible for controlling government records, which it categorizes as temporary or permanent. Permanent records must be surrendered to NARA within 25 years of their creation; temporary records (the bulk of the TRU waste collection) remain with the organization creating them or a designated custodian. Some TRU-related records are not scheduled for disposition and so NARA will not accept them.

With this investment, the WIPP Records Archive (WRA) will:

- accept unscheduled records,
- allow public web-based access to non-sensitive records related to WIPP waste,
- allow controlled access to sensitive information,
- protect chain of custody (making records defensible for researchers, historians, and in litigation and Freedom of Information Act (FOIA) requests), and
- allow the government to respond positively to growing public interest in TRU waste-related records.

DOE has about three million boxes of temporary long term records (some of which have schedules of hundreds of years), ~125,000 of them related to WIPP. Storage at multiple sites threatens the historical integrity of the WIPP site. The WRA uses the latest web-based technology to facilitate public access to records. Continuing to manage paper records in a NARA-regulated Federal Records Center is more costly and less efficient, with no assurance that related records will be kept together.

WRA's RM technology can reduce costs and make information more accessible while maintaining data integrity and privacy. State and Federal agency collaboration is planned, including other DOE sites, which can use WRA as a solution for all WIPP/TRU records and other long-term temporary records across the complex. This investment aligns with Environmental Management (EM) EA BRM 404141, Info. & Tech. Mgmt., and supports EM program goal 4.2, Managing the Legacy. PM is Level II certified by PMI.

### 4.2.5 National Nuclear Security Administration: NNSA STA Transportation Command and Control System

The Secure Transportation Asset (STA) Transportation Command and Control System (TCCS) specifically supports the following NNSA long-term strategic goals:

Goal 1: Nuclear Weapons Stewardship, and
Goal 2: Nuclear Nonproliferation.

Specifically, the NNSA fulfills these goals through the TCCS as follows:

Goal 1: Nuclear Weapons Stewardship - the TCCS provides technical leadership to prevent the spread of materials, technology, and expertise related to Weapons of Mass Destruction.

Goal 2: Nuclear Nonproliferation - the TCCS ensures that our nuclear weapons continue to server their essential deterrence role by providing safe and secure transportation services and by maintaining asset security while in transport.

The mission of the Office of Secure Transportation (OST) is to provide safe and secure ground and air transportation of nuclear weapons and components and special nuclear materials, and conduct other tasks supporting the national security of the United States. The Transportation Command and Control System (TCCS) assists in this mission by providing planning, scheduling, resource and consequence management, as well as operations tracking and monitoring of convoys.

The TCCS acts as a centralized command and control center for the OST. It provides for multiple communications channels utilizing a number of different technologies, as well as robust data storage and processing capabilities. It incorporates multiple client-server relationships, flexible data structures utilizing multiple databases, and an overall level of redundancy and robustness sufficient to meet the OST-leveled command and control requirement.

The system ensures communication channels are available in a variety of situations and conditions to meet the needs of the mission. Pending appropriate funding, OST will also begin pursuing e-Authentication solutions in 2007 in the high assurance authentication category. In support of the NNSA commitment to keep nuclear devices and material out of the hands of Terrorists, OST has accumulated more than 100 million miles of over-the-road experience and 90,000 hours of airtime over the past 30 years with no release of radioactive material, no loss of cargo and no accidents causing a fatality. The program is designed to conduct shipments across state jurisdictions with nuclear materials couriers who have specialized training and Federal authority. The shipments require the use of customized trailers and vehicles, operated by carefully screened individuals who are rigorously trained on various response situations.

### 4.2.6 National Nuclear Security Administration: NNSA ASC LANL Roadrunner Platform (formerly NNSA ASC Future Platform)

The Advance Simulation and Computing (ASC) Roadrunner Base Capacity System (Redtail) was acquired to provide High-Performance capacity compute cycles for the DOE/NNSA weapons laboratories - LANL, LLNL, and SNL to meet DOE mission deliverables. The Roadrunner Platform will provide over 70 teraflops of peak computing performance for the ASC program. The system completed acceptance testing in December 2006 and has been undergoing integration and security testing.

The system was accredited for classified computing in May 2007 and has been integrated into the classified network at LANL. The system is scheduled to transition to initial production status in late August 2007. This is a short lifecycle, proof of concept project that will end in 2010. There is no planned reuse. In addition to providing more cycles, the Roadrunner base system has allowed LANL DOE NNSA to retire the aging LANL Q system.

Roadrunner supports the 2006 DOE Strategic Plan under Strategic Theme 2, Nuclear Security - Ensuring America's nuclear security: Goal 2.1 Nuclear Deterrent - Transform the Nation's nuclear weapons stockpile and supporting infrastructure to be more responsive to the threats of the 21st Century. Because the Federal government exercises exclusive purview over nuclear weapons computations through NNSA and its weapons complex, there are no alternative public/private sector sources that could perform the Roadrunner functions.

Roadrunner is included in the DOE EA under the investment name Nuclear Weapons Stockpile Certification and Testing. Agency Component Names and descriptions are - Modeling- develop descriptions to adequately explain relevant data for the purpose of prediction, pattern detection, exploration or general organization of data; and Simulation-utilize models to mimic real-world processes. In the Federal EA SRM for both agency components, Business Analytical Services is the service Domain, and Knowledge Discovery is the service Type.

Roadrunner is a firm fixed-price Management and Operating (M&O) contract competitively awarded at $57.7M on 9/7/2006. Contractual measures to phase-in this investment have been met. ASC Roadrunner is a partnership between the DOE/NNSA Advanced Simulation and Computing Program (historically known as ASCI, now ASC) and IBM Corporation with Los Alamos National Laboratory as the lead laboratory.

Transitioning of the workload handled by Q to Roadrunner will begin by October 2007. If Roadrunner cannot begin as scheduled, Q will continue operation until Roadrunner is ready.

### 4.2.7 Office of Security: HS E-DOE Integrated Security System+ (eDISS+)

The Office of Security work associated with the e-DISS+ includes developing and supporting software applications used complex-wide that facilitate the collection, processing, storing, and transfer of personnel security data by utilizing the Personnel Security Database (PSDB). e-DISS+ is the system of record for DOE clearances providing mission critical access authorization information to the entire DOE complex.

e-DISS+ is a critical component in the DOE enterprise providing information to help prevent unauthorized access to classified or sensitive areas. e-DISS+ is the DOE system used to support the PMA E-Gov eClearance initiative supplying daily and monthly updates of clearance information to the Office of Personnel Management's (OPM) Clearance Verification System (CVS) for use government-wide. e-DISS+ began as a modernization effort to web-enable the existing legacy client applications from the DISS system.

This effort will end in FY07 with new development efforts planned which will evolve the modernized e-DISS+ system into a case management system that will integrate the existing personnel security information with other systems containing HR, employment status, badge access, and other information relative to safeguarding DOE assets. Inspector General (IG) Report DOE/IG-0651, June 2004 identified $13 million in duplicative personnel security system development efforts at DOE locations due to the lack of a comprehensive personnel security and access control system.

Re-engineering the e-DISS+ system will close the gap identified in the IG report by addressing the need for a comprehensive personnel security and access control system that will improve efficiency by automating processes across the DOE lines of businesses. The development of the e-DISS+ case management system will start 1QFY07 with completion scheduled 4QFY08.

In addition to addressing duplicate system costs the development of a case management system will provide additional cost savings from planned workflow elements that will improve efficiencies for those involved with the personnel security clearance business process, such as: automated scheduling and reporting; budgeting and financial planning; automatic notifications.

In the FY 2009 to FY 2013 period, the case management system will become the focus of operational support, and development and enhancement will concentrate on integration of the case management system with Human Resources and complex-wide badging systems.

### 4.2.8 Office of Security: HS (SP) Nuclear Materials Management and Safeguards System (NMMSS)

NMMSS is a database management system (DBMS) run by the Office of Security for tracking and accounting for nuclear materials controlled or licensed by the U.S. Government. NMMSS is the official system for tracking and reporting of strategic nuclear materials subject to special control and accountability requirements and is therefore inherently a government function shared by the Department of Energy (DOE) and the Nuclear Regulatory Commission (NRC).

NMMSS was created to support safeguards and nuclear materials management objectives in the domestic and foreign utilization of nuclear resources and is in direct support of DOE's Strategic Theme 2 Nuclear Security Goal 2.2 Weapons of Mass Destruction. The steady state operational costs of the entire NMMSS Program are shared 60% and 40% respectively between the DOE and NRC. NMMSS supports the PMA initiatives of E-Gov collaboration and reuse and Real Property Asset Management by integrating the support of DOE and NRC reporting and analysis plus international treaties through the Department of State to account for nuclear materials inventory.

NMMSS further collaborates with DOE through its interface with Local Area Nuclear Material Accountability Software (LANMAS), the software designed in accordance with DOE Material Control and Accounting (MC&A) directives to assist sites with nuclear materials control and accountability operations and mandatory reporting to NMMSS. NMMSS satisfies the nuclear materials information requirements of agreements between the U.S. and foreign entities.

In addition, this system provides the reporting interface between the International Atomic Energy Agency (IAEA) and facilities selected under the provisions of the U.S./IAEA agreement. NMMSS contains records of all nuclear materials supplied and controlled under U.S. law and related international agreements including U.S. nuclear materials production programs and U.S. private nuclear industrial activities. NMMSS supports a reporting group of about 800 generating some 1,200 reports from this data in an average month.

DME dollars modernize the technology platform to Microsoft Standard Query Language (SQL), as described in the SP specific architecture via DEAR mappings and associated DEAR reports. The NMMSS application is currently operating on an unsupported FoxPro 2.5 for DOS database platform, not in alignment with EA TS&SP. The obsolete platform has constrained the capacity to update and enforce regulations. The DME funding will address this misalignment to ensure technology compatibility with the EA and to update and enforce regulations.

### 4.2.9 Science: PNNL EMSL Molecular Science Computing Facility (MSCF)

The Molecular Science Computing Facility (MSCF) is a mixed lifecycle investment which is part of the Environmental Molecular Sciences Laboratory (EMSL), a U.S. Department of Energy (DOE) national scientific user facility located at Pacific Northwest National Laboratory (PNNL). The MSCF, managed by the DOE Office of Science (SC) Biological and Environmental Research (BER) Program, provides supercomputing capability to accomplish DOE strategic goal 3.1 to further the President's American Competitiveness Initiative.

MSCF provides supercomputer time and high-capacity data storage systems to its users. MSCF is the only computing facility in the DOE complex that optimizes its systems for the needs of environmental molecular sciences. For example, it is a key tool in DOE's efforts to predict contaminant movement and the impact of remediation methods at contaminated DOE sites, enhance chemical processes (e.g., catalysis) for more efficient energy utilization and less environmental impact, and improve the general understanding of complex and coupled chemical, biological and physical processes.

Following best practices, MSCF maintains a system lifecycle in which high performance systems are replaced every three years. New systems are acquired by procuring commercially available hardware and software via fixed price contracts. Procurement cycles are timed so that new systems complete acceptance when the previous-generation system reaches obsolescence.

The current supercomputer is a Linux-based system with a peak performance of 11.8 teraflops and 9.7 terabytes of memory. MSCF supercomputer time is made available to users funded by DOE's basic (Biological and Environmental Research, Basic Energy Sciences, etc.) and applied R&D (Environmental Management, Legacy Management, Nuclear Energy, Energy Efficiency) programs, as well as users funded by other Federal agencies (e.g., NSF, NIH, USGS, DOD, EPA, etc.)

During development of the BY09 business case, MSCF Project Management reevaluated the investment's PMA alignment and determined it supported only the R&D Investment Criteria in the PMA (as no PMA E-Gov initiative exists for high performance computing). MSCF supports the Scientific and Technological Research and Innovation sub-function of the General Science and Innovation LOB of the Services for Citizens business area of the BRM, and provides computational resources as "Services for Citizens" (001109026) in "Research and Development" (002202069).

### 4.2.10 Science: ORNL Leadership Computing Facility (OLCF)-Direct Mission

The Office of Science (SC) Oakridge National Laboratory (ORNL) Leadership Computing Facility (LCF) is a mixed lifecycle investment to develop and operate increasingly higher performance computers to enable major advances in computational science as part of the DOE Advanced Science Computing Research (DOE-ASCR) LCF Program. The OLCF is intended for open, unclassified science research on capability-limited computational grand challenges and is made available to the scientific community primarily through DOE-SC's Innovative and Novel Computational Impact on Theory and Experiment (INCITE) Program. The investment covers the operation of existing systems and the lease-to-own acquisition of more advanced systems and the effort and infrastructure needed to run them.

OLCF plans a low-risk, incremental increase program to achieve a petascale computing system by FY09 with further increases in capacity every 2 years after that. In FY05, ORNL achieved 18 teraflops (TF), then 25TF; 50TF was achieved in FY06 and 119TF in FY07. A 250TF upgrade is scheduled for FY08.

A new 1 petaflop (PF) system is planned for FY09 with that machine upgraded further in FY11. Whether the FY13 system is a new machine or an upgrade is yet to be determined. The progression of OLCF systems will help fill the gap between the 198M CPU computing hours requested in 2007 and the 75M allotted through the INCITE Program.

The OLCF Program is based on an evaluation of the near- and long-term needs of DOE-SC computational scientists which are derived from DOE strategic and tactical programmatic goals and from collaboration in algorithm and reusable code solutions with the general science community, e.g., DOE Energy Science researchers; DOE-SC collaborators; other Federal agencies such as NASA, NIH, NSF; and university and industrial research collaborators.

These wide-ranging collaborations directly support the President's 'Competitive' and 'American Energy' Initiatives. OLCF directly supports DOE's mission "to advance the national, economic and energy security of the United States; to promote scientific and technological innovation in support of that mission". Moreover, it satisfies DOE's Science Strategic Goal 3.1, Scientific Breakthroughs and all 7 of DOE-SC's Goals, especially #6 ("Deliver Computing for the Frontiers of Science") and #7 ("Provide the Resource Foundations that Enable Great Science"), by providing key leadership class computational capabilities and infrastructure required for US scientific innovation (as "Services for Citizens" (001109026) in "R&D" (002202069)). It maps directly to the BRM function of Scientific Research & Advanced Computational Science/Scientific Research.

### 4.2.11 Science: SC Lattice Quantum ChromoDynamics (LQCD) Computing

LQCD Computing is part of DOE Office of Science (SC) High Energy Physics (HEP) & Nuclear Physics (NP) programs to accomplish SC strategic goal 6 (Deliver computing for the frontiers of science) and DOE strategic goals 3.1 (Scientific Breakthroughs) & 3.2 (Foundations of Science) to further the President's "Competitive" Initiative. The theoretical framework for large experimental programs in HEP & NP is QCD. Many of the properties of QCD most important to the experimental programs can only be determined through large scale computer simulations.

The SC Scientific Discover through Advanced Computing (SciDAC) Lattice QCD Computing project (2001-2006) identified the need for tens of teraflop-years of sustained integrated computing power dedicated to QCD simulations. By the end of FY09, the LQCD project will operate facilities with an aggregate capacity of 17.4 TF/s to meet this need. The computer hardware is housed at Brookhaven National Laboratory (BNL), Fermi National Accelerator Laboratory (FNAL), and Thomas Jefferson National Accelerator Facility (TJNAF). In addition to the computers acquired by this investment, the hardware operated includes the QCDOC (quantum chromodynamics on a chip) supercomputer completed at BNL in 2005 & the prototype LQCD clusters built at FNAL and TJNAF by the DOE SciDAC Lattice QCD project.

The DME, or project, phase of this investment is complete after system acceptance; therefore, the Total Project Cost for this investment's lifecycle is the total DME ($6.251M). This investment provides funds for operational support through FY09. Planning is underway for a follow-on project to provide ongoing operations and maintenance support for the computers acquired by this investment through the end of their lifecycle. Existing LQCD distributed cluster systems and supercomputers comply with the DOE technical architecture. These systems run physics applications built using optimized LQCD libraries developed by the SciDAC project.

Collaboration with the SciDAC-2 LQCD project, funded by the HEP, NP, and ASCR (Advanced Scientific Computing Research) program offices, allows the development of further optimizations that increase the cost effectiveness of the hardware acquired by this investment. This investment supports the Scientific and Technological Research and Innovation sub-function of the General Science and Innovation LoB of the Services for Citizens business area of the BRM. In particular, LQCD provides computational resources as "Services for Citizens" (001109026) in "Research for Development" (002202069).

### 4.2.12 Science: ANL Leadership Computing Facility (ALCF)

ALCF, as part of the Advanced Scientific Computing Research (ASCR) INCITE Program, provides supercomputing capability to accomplish SC strategic goal 6 and DOE strategic goal 3.1. It furthers the President's Competitive and American Energy Initiatives by:

- advancing fundamental scientific discovery to improve future quality of life,
- enabling potential high-payoff activities that help achieve national goals like energy independence, and
- improving the ability to understand and respond to climate change and other global environmental issues/natural disasters through better observation, data, analysis, models, and basic and social science research.

In DOE's SG 3.1, scientific breakthroughs are enabled by advancing the leadership class computational capabilities required for frontiers of scientific discovery, e.g., fuel cells, fusion, biotechnology, nanotechnology, climate prediction, pollution remediation.

DOE-SC's INCITE program received user requests for 198 million CPU hours in FY2007, but only 95 million hours could be allocated. ALCF addresses the gap by providing INCITE researchers with additional computational capability to facilitate more concurrent leadership projects, reducing computational time, and increasing data storage capacity. This investment covers IBM Blue Gene systems whose design and configuration compliments systems at other DOE facilities and complies with the DOE supercomputing technical architecture. Blue Gene excels in many areas essential for advances in energy systems, life sciences, environment, and basic science.

In these and other areas ALCF supports missions across SC, and key collaborators like NASA and NSF. The proven outstanding price-performance of Blue Gene for large, complex computations, coupled with low power and space needs make it the best alternative. Stepwise deployment of proven designs yields low and manageable risk for the Blue Gene/P systems in 2007 and 2008. Key applications will be ready when the systems are operational, maximizing scientific return.

The investment combined with the INCITE program will break new ground; researchers can attack difficult unsolved problems and make significant national contributions to reduce energy usage/costs. ALCF provides computational resources as "Services for Citizens in "Research and Development". There is no PMA E-Gov initiative for Leadership-class computing.

### 4.2.13 Science: LBNL NERSC-Direct mission-M&O Cont.

SC Lawrence Berkeley National Laboratory (LBNL) National Energy Research Scientific Computing Center (NERSC), sponsored by the Department of Energy Office of Science acquires, operates and maintains a supercomputer facility at Lawrence Berkeley National Laboratory in Berkeley California. The NERSC facility, designated as DOE's Flagship Supercomputing Facility, provides one of the most effective and productive unclassified high end computing resources for computational sciences in the world.

This investment supports the programmatic goals of the Department of Energy and Office of Science by operating increasingly higher performance computers to enable advances in scientific research sponsored by the Department of Energy and its collaborators. This investment addresses the performance gap by reducing the deficit between computational research hours needed by and delivered to science programs. Over the past four years, the hours requested by science programs grew from 114.7M in 2004 to 200.4M in 2007. This growth trend to support U.S. science competitiveness is expected to continue.

Additionally, the growth rate is expected to be compounded by initiatives like Scientific Discovery through Advanced Computing-II and the Innovative and Novel Computational Impact on Theory and Experiment Programs which produced over 190.6M requested hours since 2004. Without the additional hours, scientists will not deliver world class science.

With the current budget, NERSC is on track in 2007 to deliver 95 million Computational Resource Hours with an expanded goal of delivering 450 million in 2008, 725 million in 2009 and over 1,200 million in 2010. In addition to this increase in computational hours, the facility will continue to maintain customer satisfaction and resource availability for its 2800+ users across the scientific community. The performance targets are inline DOE theme 3 Scientific Discovery and DOE strategic goals 3.2 and 3.1 and the Office of Science's strategic goals to close the computational gap for open science research.

NERSC directly supports the mission through its business functions:

1. service to citizens, general scientific innovation, scientific and technological research and innovations, and
2. mode of delivery, knowledge creation and management, research and development.

Finally, the management of this investment involves extensive collaboration with the science community to include DOE energy researchers, NASA, DOD, NSF, university researchers, industrial research collaborators and international science bodies.

## *4.3 BY 2009 Major DME Investment Activity Milestone Sequencing Plan*

The 13 Major Investment projects that have DME funding in BY 2009 have milestones listed on their Exhibit 300 documents. The DOE Sequencing Plan is represented by the Work Breakdown Structure (WBS) where the ***Key DME Milestones*** are scheduled together on one integrated project plan. These 13 projects are sequenced as the DOE Transition Projects and summarized in Figure 6 - Summary WBS of the DME DOE Sequencing Plan.

| Task Name | Duration | Finish |
|---|---|---|
| Environmental Management: CBFO Waste Isolation Pilot Plant (WIPP) Records Archive (WRA) | 389 days | Tue 9/30/08 |
| Office of Security: HS (SP) Nuclear Materials Management and Safeguards System (NMMSS) | 240 days | Wed 10/1/08 |
| Science: SC Lattice Quantum ChromoDynamics Computing (LQCD) | 523 days | Wed 9/30/09 |
| Energy Efficiency & Renewable Energy: EE Corporate Management and Planning System | 457 days | Wed 9/30/09 |
| National Nuclear Security Administration: NNSA ASC LANL Roadrunner Platform | 523 days | Wed 9/30/09 |
| National Nuclear Security Administration: NNSA STA Transportation Command and Control System | 784 days | Thu 9/30/10 |
| Science: PNNL EMSL Molecular Science Computing Facility (MSCF | 1305 days | Fri 9/28/12 |
| Science: ORNL Leadership Computing Facility (OLCF)-Direct Mission | 1457 days | Fri 9/28/12 |
| Chief Information Officer: Consolidated Infrastructure, Office Automation, and Telecommunications Program | 1305 days | Fri 9/28/12 |
| Science: ANL Leadership Computing Facility | 1500 days | Mon 9/30/13 |
| Science: LBNL NERSC-Direct mission-M&O Cont. | 1566 days | Mon 9/30/13 |
| Chief Financial Officer: CF Integrated Management Navigation System (I-MANAGE) | 1566 days | Mon 9/30/13 |
| Office of Security: HS E-DOE Integrated Security System+ (eDISS+) | 1566 days | Mon 9/30/13 |

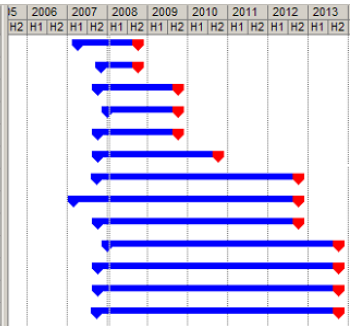



**Figure 6 - Summary WBS of the DOE DME Sequencing Plan**

The DOE Sequencing Plan also has 3 stages in its schedule for the DOE Transition Projects. They are bracketed roughly by Milestone Durations which are the periods from the earliest Key DME Milestones to the last ones for each of the DOE Transition Projects. These 3 stages are the following:

1. Near-Term Stage of DOE Sequencing Plan: Milestone Duration 0 to 999 Days. Refer to Figure 7 - Detailed WBS of the Near-Term Stage of the DOE DME Sequencing Plan
2. Mid-Term Stage of DOE Sequencing Plan: Milestone Duration 1000 to 1499 Days. Refer to Figure 8 - Detailed WBS of the Mid-Term Stage of the DOE DME Sequencing Plan
3. Longer-Term Stage of DOE Sequencing Plan: Milestone Duration 1500 Days or more. Refer to Figure 9 - Detailed WBS of the Longer-Term Stage of the DOE DME Sequencing Plan

The following sections provide the Detailed WBS' of each of these 3 stages of the DOE Sequencing Plan in the aforementioned Figures.

## 4.3.1 Detailed Near-Term Stage of DOE Sequencing Plan

| Task Name | Duration | Finish |
|---|---|---|
| Environmental Management: CBFO Waste Isolation Pilot Plant (WIPP) Records Archive (WRA) | 389 days | Tue 9/30/08 |
| Milestone 3 - Implementation of Operational Procedures | 0 days | Wed 4/4/07 |
| Milestone 4 - ERM Software Testing and Startup Reports | 0 days | Wed 4/4/07 |
| Milestone 6 - Full Operational State | 0 days | Tue 9/30/08 |
| Milestone 7 - Implement 508 compliant features for web site | 0 days | Tue 9/30/08 |
| Office of Security: HS (SP) Nuclear Materials Management and Safeguards System (NMMSS) | 240 days | Wed 10/1/08 |
| Milestone 41 - DME NMMSS Upgrade IAEA Reporting Module Development. | 0 days | Wed 10/31/07 |
| Milestone 40 - DME NMMSS Upgrade SAMS Module Development. | 0 days | Fri 1/18/08 |
| Milestone 50 - DME NMMSS Upgrade Reports Module Development. | 0 days | Wed 4/30/08 |
| Milestone 51 - DME NMMSS Upgrade Program Support Activities. | 0 days | Wed 4/30/08 |
| Milestone 53 - DME NMMS Upgrade Testing Activities. | 0 days | Wed 10/1/08 |
| Science: SC Lattice Quantum ChromoDynamics Computing (LQCD) | 523 days | Wed 9/30/09 |
| Milestone 8 - 9 Teraflops-years aggregate computing delivered to LQCD community during FY07. | 0 days | Sun 9/30/07 |
| Milestone 12 - 12 Teraflops-years aggregate computing delivered to LQCD community during FY08. | 0 days | Tue 9/30/08 |
| Milestone 15 - 15 Teraflops-years aggregate computing delivered to LQCD community during FY09. | 0 days | Wed 9/30/09 |
| Energy Efficiency & Renewable Energy: EE Corporate Management and Planning System | 457 days | Wed 9/30/09 |
| Milestone 3.1 - BARDI Integration | 0 days | Mon 12/31/07 |
| Milestone 3.2 - Portal Navigation Development | 0 days | Thu 10/30/08 |
| Milestone 6 - Development | 0 days | Thu 4/30/09 |
| Milestone 3.3 - Performance Integration | 0 days | Thu 4/30/09 |
| Milestone 11 - Development | 0 days | Wed 9/30/09 |
| National Nuclear Security Administration: NNSA ASC LANL Roadrunner Platform | 523 days | Wed 9/30/09 |
| Milestone 2 - FY07 Acquisition and Development | 0 days | Sun 9/30/07 |
| Milestone 10 - FY08 Development Ph3 | 0 days | Tue 9/30/08 |
| Milestone 11 - FY09 Development Ph3 | 0 days | Wed 9/30/09 |
| National Nuclear Security Administration: NNSA STA Transportation Command and Control System | 784 days | Thu 9/30/10 |
| Milestone 6 - Initial planning for upgrade 5.0 | 0 days | Sun 9/30/07 |
| Milestone 7 - Preliminary acquisition for upgrade 5.0 | 0 days | Sun 9/30/07 |
| Milestone 9 - Final planning for upgrade 5.0 | 0 days | Tue 9/30/08 |
| Milestone 10 - Final acquisition for upgrade 5.0 | 0 days | Tue 9/30/08 |
| Milestone 12 - Initial planning for upgrade 6.0 | 0 days | Wed 9/30/09 |
| Milestone 13 - Preliminary acquisition for upgrade 6.0 | 0 days | Wed 9/30/09 |
| Milestone 15 - Final planning for upgrade 6.0 | 0 days | Thu 9/30/10 |
| Milestone 16 - Final acquisition for upgrade 6.0 | 0 days | Thu 9/30/10 |

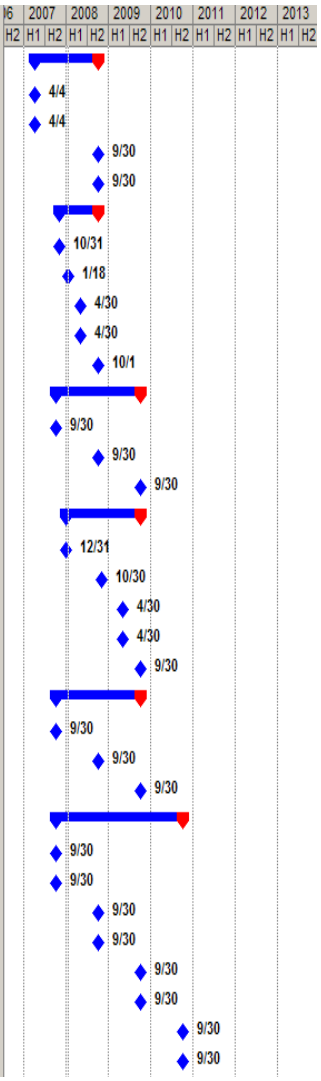



**Figure 4 - Detailed WBS of the Near-Term Stage of the DOE DME Sequencing Plan**

## 4.3.2 Detailed Mid-Term Stage of DOE Sequencing Plan

| Task Name | Duration | Finish |
|---|---|---|
| Science: PNNL EMSL Molecular Science Computing Facility (MSCF | 1305 days | Fri 9/28/12 |
| Milestone 24 - FY07 DME Lab Integration HPCS-3 | 0 days | Fri 9/28/07 |
| Milestone 31 - FY08 DME Lab Integration HPCS-3 | 0 days | Tue 9/30/08 |
| Milestone 40 - FY09 DME Lab Integration HPCS-4 | 0 days | Wed 9/30/09 |
| Milestone 47 - FY10 DME Lab Integration HPCS-4 | 0 days | Thu 9/30/10 |
| Milestone 55 - FY11 DME Lab Integration HPCS-5 | 0 days | Fri 9/30/11 |
| Milestone 63 - FY12 DME Lab Integration HPCS-5 | 0 days | Fri 9/28/12 |
| Science: ORNL Leadership Computing Facility (OLCF)-Direct Mission | 1457 days | Fri 9/28/12 |
| Milestone 12 - FY07 DME 100TF Acceptance Milestone | 0 days | Wed 2/28/07 |
| Milestone 8 - FY07 DME Hardware Acquisition | 0 days | Sun 9/30/07 |
| Milestone 16 - FY07 DME Project Management Contingency Reserve | 0 days | Sun 9/30/07 |
| Milestone 22 - FY08 DME Hardware Acquisition | 0 days | Tue 9/30/08 |
| Milestone 25 - FY08 DME NCCS (250TF) Acceptance Milestone | 0 days | Tue 9/30/08 |
| Milestone 28 - FY08 DME Project Management Contingency Reserve | 0 days | Tue 9/30/08 |
| Milestone 35 - FY09 DME Hardware Acquisition | 0 days | Thu 3/12/09 |
| Milestone 38 - FY09 DME NCCS (1PF) Acceptance Milestone | 0 days | Wed 9/30/09 |
| Milestone 41 - FY09 DME Project Management Contingency Reserve | 0 days | Wed 9/30/09 |
| Milestone 48 - FY10 DME Project Management - Risk & Change, Mgmt, QA, ESH, Reporting | 0 days | Thu 9/30/10 |
| Milestone 55 - FY11 DME Project Management - Risk & Change, Mgmt, QA, ESH, Reporting | 0 days | Fri 9/30/11 |
| Milestone 58 - FY11 DME NCCS (20PF) Acceptance Milestone | 0 days | Fri 9/30/11 |
| Milestone 63 - FY12 DME Project Management - Risk & Change, Mgmt, QA, ESH, Reporting | 0 days | Fri 9/28/12 |
| Chief Information Officer: Consolidated Infrastructure, Office Automation, and Telecommunications Program | 1305 days | Fri 9/28/12 |
| Milestone 30 - FY 2007 DME IT A76 | 0 days | Sun 9/30/07 |
| Milestone 31 - FY 2007 DME from M&O contracts | 0 days | Sun 9/30/07 |
| Milestone 40 - FY 2008 DME IT A76 | 0 days | Tue 9/30/08 |
| Milestone 41 - FY 2008 DME from M&O contracts | 0 days | Tue 9/30/08 |
| Milestone 50 - FY 2009 DME IT A76 | 0 days | Wed 9/30/09 |
| Milestone 51 - FY 2009 DME from M&O contracts | 0 days | Wed 9/30/09 |
| Milestone 54 - FY 2010 and Beyond DME | 0 days | Fri 9/28/12 |

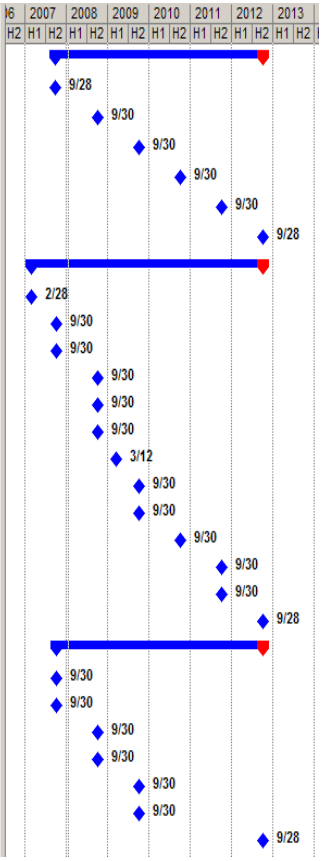



**Figure 8 - Detailed WBS of the Mid-Term Stage of the DOE DME Sequencing Plan**

### 4.3.3 Detailed Longer-Term Stage of DOE Sequencing Plan

| Task Name | Duration | Finish |
|---|---|---|
| Science: ANL Leadership Computing Facility | 1500 days | Mon 9/30/13 |
| Milestone 6 - FY08 DME Completion of ALCF elements of ANL C&A | 0 days | Mon 12/31/07 |
| Milestone 8 - FY08 DME Approval to begin operations for 100T | 0 days | Fri 5/30/08 |
| Milestone 16 - FY09 DME 500t file system installation and integrated final acceptance | 0 days | Tue 6/30/09 |
| Milestone 18 - FY09 DME Approval to begin operations for 500T file system | 0 days | Fri 7/31/09 |
| Milestone 23 - FY10 DME Planning Activities | 0 days | Thu 9/30/10 |
| Milestone 28 - FY11 DME Planning Activities | 0 days | Fri 9/30/11 |
| Milestone 33 - FY12 DME Planning Activities | 0 days | Fri 9/28/12 |
| Milestone 37 - FY13 DME Approval to begin operations for 26 PF | 0 days | Wed 7/31/13 |
| Milestone 38 - FY13 DME Planning Activities | 0 days | Mon 9/30/13 |
| Science: LBNL NERSC-Direct mission-M&O Cont. | 1566 days | Mon 9/30/13 |
| Milestone 20 - FY07 DME NERSC-5 and NERSC-6 Activities Subject to EVM under DOE CIO Guidelines | 0 days | Sun 9/30/07 |
| Milestone 25 - FY08 DME NERSC-5 and NERSC-6 Activities Subject to EVM under DOE CIO Guidelines | 0 days | Tue 9/30/08 |
| Milestone 31 - FY09 DME NERSC-6 Activities Subject to EVM under DOE CIO Guidelines | 0 days | Wed 9/30/09 |
| Milestone 37 - FY10 DME NERSC-6 and NERSC-7 Activities Subject to EVM under DOE CIO Guidelines | 0 days | Thu 9/30/10 |
| Milestone 43 - FY11 DME NERSC-7 Activities Subject to EVM under DOE IO Guidelines | 0 days | Fri 9/30/11 |
| Milestone 49 - FY12 DME NERSC-7 Activities Subject to EVM under DOE CIO Guidelines | 0 days | Fri 9/28/12 |
| Milestone 55 - FY13 DME NERSC-7 Activities Subject to EVM under DOE CIO Guidelines | 0 days | Mon 9/30/13 |
| Chief Financial Officer: CF Integrated Management Navigation System (I-MANAGE) | 1566 days | Mon 9/30/13 |
| Milestone 6.100 - 6.07.7.1-3 FY07 Deployment Enhancements | 0 days | Sun 9/30/07 |
| Milestone 6.200 - 6.08.7 FY08 Deployment/Enhancements | 0 days | Tue 9/30/08 |
| Milestone 6.300 - 6.09.7 FY09 Deployment/Enhancements | 0 days | Wed 9/30/09 |
| Milestone 6.400 - 6.10.7 FY10 Deployment/Enhancements | 0 days | Thu 9/30/10 |
| Milestone 6.500 - 6.11.7 FY11 Deployment/Enhancements | 0 days | Fri 9/30/11 |
| Milestone 6.600 - 6.12.7 FY12 Deployment/Enhancements | 0 days | Fri 9/28/12 |
| Milestone 6.700 - 6.13.7 FY13 Deployment/Enhancements | 0 days | Mon 9/30/13 |
| Office of Security: HS E-DOE Integrated Security System+ (eDISS+) | 1566 days | Mon 9/30/13 |
| Milestone 30 - Develop Personnel Security Case Management System | 0 days | Fri 9/28/07 |
| Milestone 31 - Reengineer CPCI Reports (Phase 2 - Web Architecture Implementation) | 0 days | Fri 9/28/07 |
| Milestone 17 - Reengineer CVCS application | 0 days | Tue 9/30/08 |
| Milestone 35 - Develop Personnel Security Case Management System (Phase 1 - PIV, PSFT, | 0 days | Tue 9/30/08 |
| Milestone 36 - Develop Personnel Security Case Management System (Phase 1 - PIV, PSFT, | 0 days | Wed 9/30/09 |
| Milestone 39 - Develop Personnel Security Case Management System (Phase 3 - HR Integration and Biometrics) | 0 days | Thu 9/30/10 |
| Milestone 42 - Develop Personnel Security Case Management System (Phase 3 - HR Integration and Biometrics) | 0 days | Fri 9/30/11 |
| Milestone 44 - Develop and Enhance Personnel Security Case Management System | 0 days | Fri 9/28/12 |
| Milestone 46 - Develop and Enhance Enhance Personnel Security Case Management System | 0 days | Mon 9/30/13 |

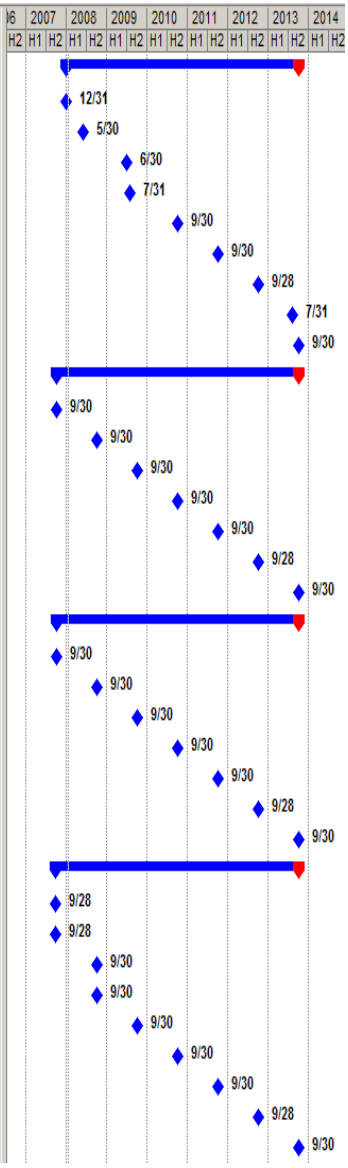



**Figure 9 - Detailed WBS of the Longer-Term Stage of the DOE DME Sequencing Plan**

# 5 EA Performance Goals and Outcomes at DOE

The Department of Energy (DOE) Enterprise Architecture (EA) is designed to improve the management planning and decision-making process by integrating EA with key DOE management processes, ensuring compliance and enforcement through a governance process that is measured and managed. This includes developing a target direction and Transition Strategy and Sequencing Plan (TS&SP) for the agency that meets our mission goals and strategic priorities. The Department of Energy's EA employs a federated approach, by incorporating into an integrated model both a Department–wide architecture as well as architectures specific to individual Departmental Elements. DOE Program Secretarial Offices support this federated approach by working collaboratively with the Office of the Chief Information Officer (OCIO) to continue to raise the maturity of the DOE EA process and tools that support the Department. This is accomplished through coordinated processes, integrated project teams, and shared system data; resulting in a business-driven EA that drives the Capital Planning process and improves executive decision making. Figure 10 –DOE EA in Use below illustrates these points.

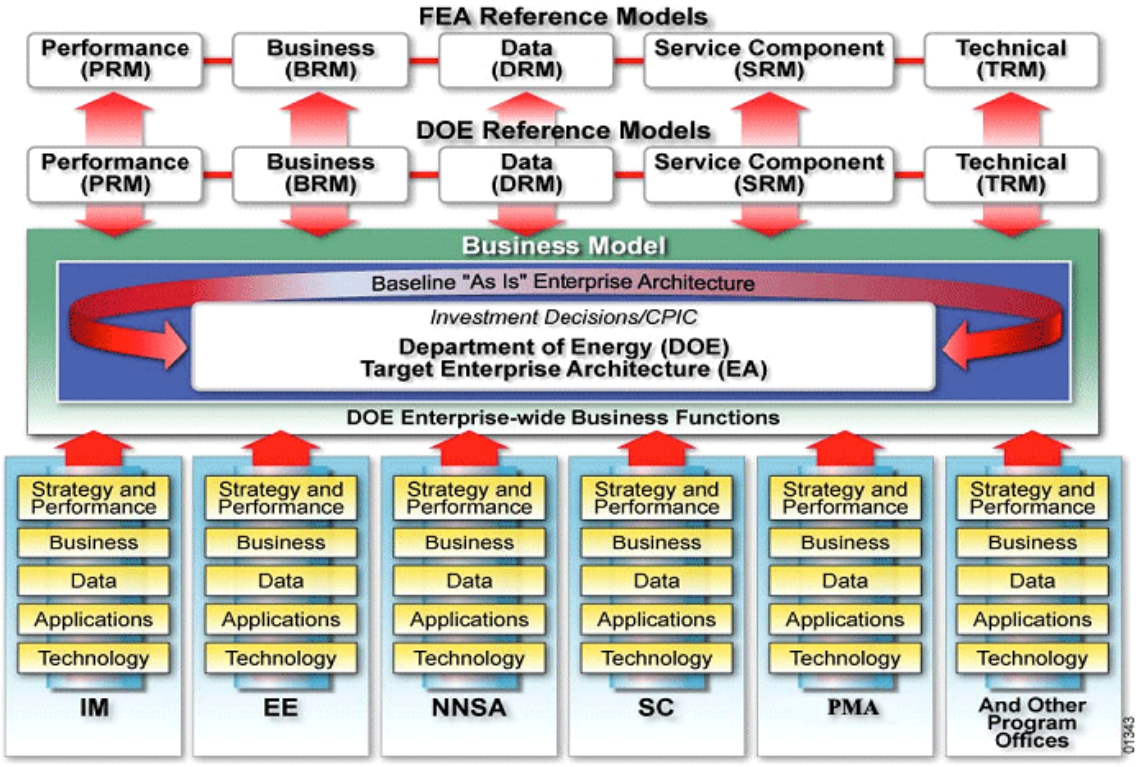



**Figure 10 - DOE EA in Use**

## *5.1 EA Performance Goals:*

To reach the stated goals of developing and maintaining an EA that is reliable, adaptable, scalable, and driven by business and technology requirements, the DOE EA Program works with the Program Secretarial Offices across the DOE enterprise to perform the following performance outcomes to achieve the subsequent performance measures. Figures 11, 12, 13, 14, 15 & 16 - DOE Major Investments Mapped to DOE Strategic Plan Goals and Performance Measures below shows how the DOE EA Program is using Performance Measures to gauge its progress with its Current Segments as well as the as DOE's IT Projects in general.

| P/SO Name | Current FY 2008 Segment Investment is Supporting | Investment Name | [redacted] | DOE Strategic Plan Goals Supported by BY 2009 Investment | BY 2009 Strategic Plan Goal Target Performance Measures |
|---|---|---|---|---|---|
| Chief Financial Office | Business Support Services | CF Integrated Management Navigation System (I-MANAGE) | | GOAL 1.3 Energy Infrastructure – Create a more flexible, secure, reliable, efficient, and higher capacity U.S. energy infrastructure by improving energy services throughout the economy and enabling the use of diverse sources. | Maintain green rating in DOE Energy Strategic Goals as reported in the DOE Performance and Accountability Report. |
| | | | | GOAL 2.1 Nuclear Deterrent – Transform the Nation's nuclear deterrent and supporting infrastructure to be more responsive to the threats of the 21st Century. | Maintain green rating in DOE Defense Strategic Goals as reported in the DOE Performance and Accountability Report. |
| | | | | GOAL 3.2 Foundations of Science – Deliver the scientific facilities, train the next generation of scientist and engineers, and provide the laboratory capabilities and infrastructure required for U.S. scientific primacy. | Maintain green rating in DOE Scientific Research Strategic Goals as reported in the DOE Performance and Accountability Report. |
| | | | | GOAL 4.1 Environmental Cleanup – Complete cleanup of the contaminated nuclear weapons manufacturing and testing sites across the U.S. Department of Energy. | Maintain green rating in DOE Environmental Strategic Goals as reported in the DOE Performance and Accountability Report. |
| | | | | GOAL 5.3 Human Capital–Attract, acquire, develop and retain a diverse highly qualified and motivated workforce to support the Department's mission and avoid any potential skill gaps that could develop from an aging workforce. | Begin alignment of I-MANAGE to the Federal LoBs (and thus supporting the President's Management Agenda) with the CHRIS migration to the HR LoB. |
| | | | | GOAL 5.5 Resources – Develop and institutionalize a fully, integrated resources management strategy that meets DOE's mission needs. | 1. Maintain a customer support satisfaction rating of 60%.<br>2. 30% of all new awards via electronic methods.<br>3. Maintain constant or increasing level of training for users.<br>4. 98% of services are delivered on time.<br>5. Maintain or lower the administrative costs per number of transactions ratio.<br>6. Maintain a green rating on 7 or more categories out of 10 as recorded on the OMB Measurement Tracking System.<br>7. Percent improvement in functional integration. (sic)<br>8. ensure year-end accounts are closed and carried forward accurately and that month-end is closed by the 3rd work day.<br>9. Maintain data error rate below 2%.<br>10. Maintain 100 percent prepared for emergencies.<br>11. Maintain 100 percent accreditation.<br>12. Ensure a 90% consistency rate.<br>13. Maintain I-MANAGE system updime in excess of 95% of schedule. |
| Chief Information Office | Investment At Large | Consolidated Infrastructure, Office Automation, and Telecommunications Program | | GOAL 5.4 Infrastructure - Build, modernize, and maintain DOE facilities and infrastructure to achieve mission goals and ensure a safe and secure workplace. | 1. Maintain 99.950% uptime.<br>2. Support 8,000 managed subscribers.<br>3. Manage 55% of network users under common Service Level Agreements.<br>4. Improve Utilization through server consolidation by 10%.<br>5. Reduce the resolution time by half an hour. |

**Figure 11 - DOE Major Investments Mapped to DOE Strategic Plan Goals and Performance Measures**

| P/SO Name | Current FY 2008 Segment Investment is Supporting | Investment Name | [redacted] | DOE Strategic Plan Goals Supported by BY 2009 Investment | BY 2009 Strategic Plan Goal Target Performance Measures |
|---|---|---|---|---|---|
| Energy Efficiency & Renewable Energy | Investment At Large | EE Corporate Management and Planning System | | GOAL 5.5 Resources – Develop and institutionalize a fully, integrated resources management strategy that meets DOE's mission needs. | 1. Increase by 10% the ratio of obligations ($) to approved funding plan ($) by June.<br>2. Issue at least 60% of program commitments by January 31, 2009.<br>3. Decrease by 10% the ratio of end uncosted obligations ($) to total obligations ($) by end of fiscal year.<br>4. Decrease by 10% user requests requiring code changes. |
| | | | | GOAL 1.1 Energy Diversity – Increase our energy options and reduce dependence on foreign fuel supplies, thereby reducing vulnerability to disruption and increasing the flexibility of the market to meet U.S. needs. | Meet over 80% of Annual Performance Targets for Energy Conservation and Preparedness by end of FY 2009 |
| | Investment At Large | EE State Grant Administration | | GOAL 1.4 Energy Productivity – Improve the energy efficiency of the U.S. economy. | No additional performance metrics developed beyond those for FY 2008, however for FY 2008, these were the metrics:<br>1. Maintain at least 90% yearly average of closed hotline calls divided by new hotline calls.<br>2. 76,186 homes to be weatherized in 2008, target determined by program budget.<br>3. Maintain at least 1000 Transactions per year. |
| Environmental Management | Investment At Large | EM HQ Integrated Planning, Accountability, and Budgeting System Information System (IPABS-IS) | | GOAL 4.1 Environmental Cleanup – Complete cleanup of the contaminated nuclear weapons manufacturing and testing sites across the U.S. Department of Energy. | 1. By the end of FY 2009, IPABS-IS will be used for about 98% of the data included in the EM budget request to Congress. The remaining 2% of data are provided from offline sources, mostly as edits or additions to existing data. Actual results will be available Q2 FY 2009.<br>2. Data submitted on July 15, 2009 to provide life-cycle cost data to the IG Auditors by July 15th of every year, in order to support timely, efficient data submission for the DOE-EM Environmental Liability Estimate.<br>3. Produce the EM Congressional Budget by January 2009.<br>4. Over 98% of all EM HQ budget formulation-related data will be collected through IPABS-IS.<br>5. Increase number of reports automatically updated in the Report Module for a total of 95%.<br>6. Respond to over 99% of customer requests in 24 hours.<br>7. Maintain over 99% system uptime. |
| | Investment At Large | BJC Contractor Business and Administrative (CBA) Systems | | GOAL 4.1 Environmental Cleanup – Complete cleanup of the contaminated nuclear weapons manufacturing and testing sites across the U.S. Department of Energy. | 1. Maintain customer satisfaction ratings of 4.5 out of 5.0 for the applications represented by the CBA investment. If this investment were not funded, we would not be able to resolve system problems and remediation would suffer.<br>2. 159 Industrial Facility Completions at ETTP.<br>3. 3,357 Cubic Meters of Low Level Waste Disposed at ETTP.<br>4. 4 Nuclear Facility Completions at ETTP.<br>5. 7 Radiological Facility Completions at ETTP.<br>6. 80 Release Site Completions at ETTP.<br>7. 590 Cubic Meters of TRU Waste Shipped at ETTP.<br>8. Maintain 0 unauthorized releases of PII for the applications contained in the CBA investment.<br>9. Maintain 0 successful unauthorized accesses and 0 malicious code attacks for the applications contained in the CBA investment. If this investment were not funded, there could be potential for disruptions and compromise of business processes and data. TBD.<br>10. Maintain computing resource availability of 99.0% for the resources supporting the CBA investment. If this investment were not funded, we would not be likely to meet the planned performance targets for disposal of Low Level and Mixed Low Level Waste. |

**Figure 12 - DOE Major Investments Mapped to DOE Strategic Plan Goals and Performance Measures (continued)**

| P/SO Name | Current FY 2008 Segment Investment is Supporting | Investment Name | [redacted] | DOE Strategic Plan Goals Supported by BY 2009 Investment | BY 2009 Strategic Plan Goal Target Performance Measures |
|---|---|---|---|---|---|
| Environmental Management | Investment At Large | SR Contractor Business and Administrative (CBA) Systems | | GOAL 5.1 Integrated Management–Institute integrated business management approach throughout DOE with clear roles and responsibilities and accountability to include effective line management oversight by Federal and contractor organizations. | 1. Increase % internal customer satisfaction with functionality and capability of IT delivered solutions as measured by customer survey.<br>2. Increase use of electronic process for HRMS access requests by 90%. CPC16 Plus application is currently configured and has been exercised.<br>3. Increase % positive impacts as determined by customer survey. |
| | | | | GOAL 5.3 Human Capital–Attract, acquire, develop and retain a diverse highly qualified and motivated workforce to support the Department's mission and avoid any potential skill gaps that could develop from an aging workforce. | Increase collaboration with customer as measured by customer survey. Work with customer to evaluate possibility of module implementation. |
| | Geospatial Science Segment | SR Mission Support Systems | | GOAL 4.1 Environmental Cleanup – Complete cleanup of the contaminated nuclear weapons manufacturing and testing sites across the U.S. Department of Energy. | P&CS availability to meet or exceed customer requirements, generally >98%. Update standards for efficient and effective processes and practices to support customers' organizations and their specific Process & Control Services initiatives. |
| | | | | GOAL 5.1 Integrated Management – Institute integrated business management approach throughout DOE with clear roles and responsibilities and accountability to include effective line management oversight by Federal and contractor organizations. | 1. Increase % customer satisfaction with functionality and capability of IT delivered solutions.<br>2. Implement SmartPlant in 80% of site facilities.<br>3. Increase % positive Customer impacts. Measure by % positive, negative and not applicable impacts made by application enhancements, releases and outages. Measure via customer survey sent to customers of solutions implemented within the previous month. |
| | Investment At Large | RL PHMC - Business Management System (BMS) | | GOAL 5.1 Integrated Management – Institute integrated business management approach throughout DOE with clear roles and responsibilities and accountability to include effective line management oversight by Federal and contractor organizations. | Target is 0 IT findings for FY2009 for Sarbannes-Oxley IT Audit on BMS Applications |
| | Investment At Large | CBFO Waste Isolation Pilot Plant (WIPP) Records Archive (WRA) | | GOAL 4.2 Managing the Legacy – Manage the Departments' post-closure responsibilities and ensure the future protection of human health and the environment. | 1. 100% Accuracy of Service or Product Delivered; Percentage of quality images available on-line and via web page access.<br>2. 100% for Strategic Planning; Percentage processed of boxes received.<br>3. Exclude 100% of sensitive images for Security; Percent of images with sensitive data excluded from web accessible database.<br>4. 100% of non-sensitive images available within 60 days of arrival at WRA for IT Contribution to Process, Customer, or Mission; Percentage of non-sensitive images available on the web site. |
| National Nuclear Security Administration | Investment At Large | NNSA STA Transportation Command and Control System | | GOAL 2.2 Weapons of Mass Destruction – Prevent the acquisition of nuclear and radiological materials for use in weapons of mass destruction and other acts of terrorism. | Maintain 100% safety record for Annual percentage of shipments completed safely and securely without incident. |
| | Investment At Large | NNSA Y12 ERP | | GOAL 5.4 Infrastructure - Build, modernize, and maintain DOE facilities and infrastructure to achieve mission goals and ensure a safe and secure workplace. | 1. Provide activation of available online query and reporting tools for internal managers, extending the benefits of E-Recruit from HR to the field. Further reduce response/cycle time for hiring process allowing more rapid and effective staff additions.<br>2. Extend already-configured warehouse and inventory management modules to support hazardous material inventory management in material control areas.<br>3. Utilize mobile devices to record calibration results in the field and upload results to the ERP at completion of calibration rounds. Elimination of manual recording (~1 hr. per day) and possibilities for error in re-key process.<br>4. Extend already-configured Plant Maintenance module to allow replacement of Software License Management System. |

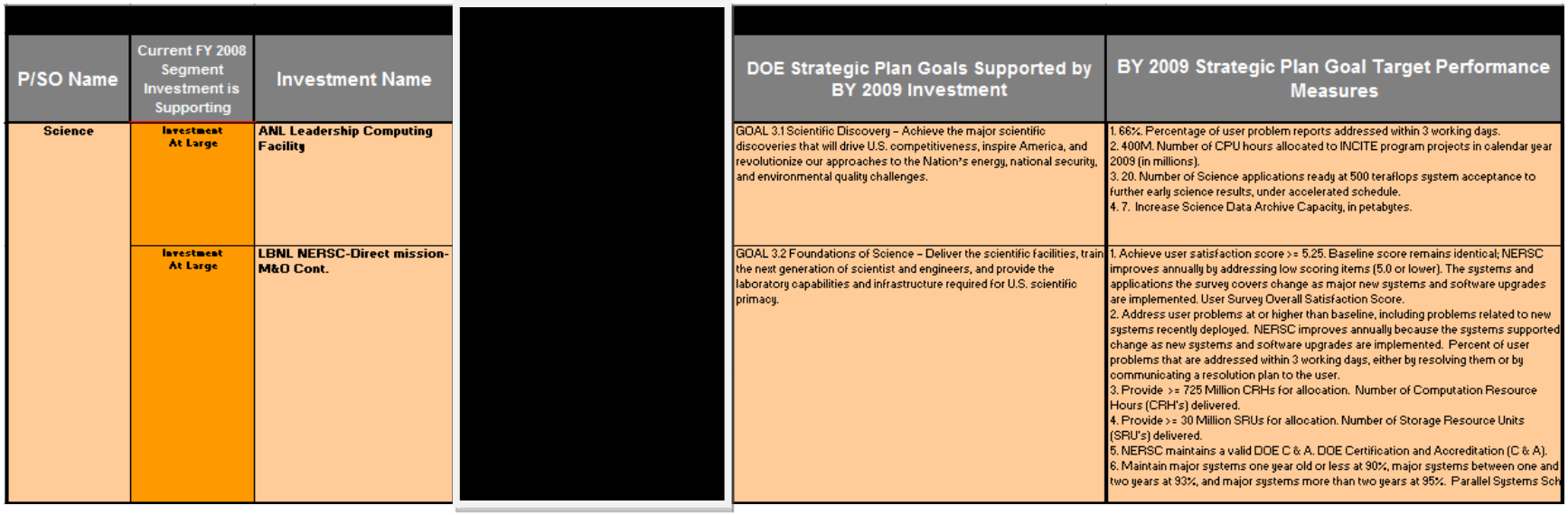
**Figure 13 - DOE Major Investments Mapped to DOE Strategic Plan Goals and Performance Measures (continued)**

| P/SO Name | Current FY 2008 Segment Investment is Supporting | Investment Name | DOE Strategic Plan Goals Supported by BY 2009 Investment | BY 2009 Strategic Plan Goal Target Performance Measures |
|---|---|---|---|---|
| National Nuclear Security Administration | Investment At Large | NNSA ASC LANL Roadrunner Platform (formerly NNSA ASC Future Platform) | GOAL 2.1 Nuclear Deterrent – Transform the Nation's nuclear deterrent and supporting infrastructure to be more responsive to the threats of the 21st Century. | 1. 70% Sustained calculation speed measured in calculations per second relative to peak system flop.<br>2. 7000 Annual simulations run on platform.<br>3. 65% CPU Utilization: Measures the time period (cycles) that a CPU actually performs its intended function to enable response to stockpile issues.<br>4. 65% Time Available: Measures platform uptime for simulation codes needed to perform predictive capability. |
| | Investment At Large | NNSA ASC LANL-Q Platform | Goal 2.1 Nuclear Deterrent - Enable transformation of the Nation's nuclear weapons stockpile and supporting infrastructure to be more responsive to the threats of the 21st Century. | No additional performance measures developed beyond those for FY 2007, however for FY 2007, these were the measures:<br>1. 90% Time Available: Measures platform uptime for simulation codes needed to perform predictive capability.<br>2. 5500 Annual simulations run on Q platform.<br>3. 85% CPU Utilization: Measures the time period (cycles) that a CPU actually performs its intended function to enable response to stockpile issues.<br>4. 65% Sustained calculation speed measured in calculations per second relative to peak system flop. |
| | Investment At Large | NNSA ASC LLNL Purple Platform | GOAL 2.1 Nuclear Deterrent – Transform the Nation's nuclear deterrent and supporting infrastructure to be more responsive to the threats of the 21st Century. | 1. 96% Time Available: Measures platform uptime for simulation codes needed to perform predictive capability.<br>2. 32% Capability Performance Indicator: Measures the percentage of simulations that use at least 30% of the platform capability.<br>3. 95% Node Utilization: Measures the time period (cycles) that a CPU actually performs its intended function to enable response to stockpile issues.<br>4. 96% Time Available: Measures platform uptime for simulation codes needed to perform predictive capability. |
| | Investment At Large | NNSA ASC SNL Red Storm Platform | GOAL 2.1 Nuclear Deterrent – Transform the Nation's nuclear deterrent and supporting infrastructure to be more responsive to the threats of the 21st Century. | 1. TBD Sustained calculation speed measured in calculations per second relative to peak system flop.<br>2. TBD Annual # of simulations run on platform.<br>3. 3% CPU Utilization: Measures the time period (cycles) that a CPU actually performs its intended function to enable response to stockpile issues.<br>4. 1% Time Available: Measures platform uptime for simulation codes needed to perform predictive capability. |
| Office of Civilian Radioactive Waste Management | Investment At Large | RW DOE Licensing Support Network (LSN) | GOAL 1.2 Environmental Impacts of Energy – Reduce greenhouse gas emissions and other environmental impacts (water use, land use, criteria pollutants) from our energy production and use. | 1. Provide 99% availability and accessibility to documentary material on the OCRWM LSN. Continue to provide 24/7 uptime and to maintain and manage the files on the external server which is being crawled daily by the NRC and the images are provided to users of the LSN.<br>2. 100% LSN-relevant information uploaded. Compliance with Nuclear Regulatory Commission Regulation 10 CFR Part 2 Subpart J.<br>3. Process and place onto the DOE LSN 98% of the documents received within 60 days of receipt. Process and place onto the DOE LSN all of the documents received within 60 days of receipt.<br>4. Rapid response to NRC requests for information. Having data easily accessible for NRC discovery process. |

**Figure 14- DOE Major Investments Mapped to DOE Strategic Plan Goals and Performance Measures (continued)**

| P/SO Name | Current FY 2008 Segment Investment is Supporting | Investment Name | DOE Strategic Plan Goals Supported by BY 2009 Investment | BY 2009 Strategic Plan Goal Target Performance Measures |
|---|---|---|---|---|
| Science | Investment At Large | LBNL Energy Sciences Network (ESnet) | GOAL 3.2 Foundations of Science – Deliver the scientific facilities, train the next generation of scientist and engineers, and provide the laboratory capabilities and infrastructure required for U.S. scientific primacy. | 1. Increase the average bandwidth by 20%. Average of the total useful bandwidth.<br>2. Increase the ratio by 20% every year. Ratio of Staff to useful bandwidth.<br>3. Decrease the cost per Gigabit/sec. of useful bandwidth by at least 5%. The cost per Gigabit/sec of useful bandwidth.<br>4. Increase the average number of connections to all sites and peers by 10%. The average number of connections to the OSC National Labs and the three primary R&E peering partners. |
| | Geospatial Science Segment | PNNL EMSL Molecular Science Computing Facility (MSCF) | GOAL 3.1 Scientific Discovery – Achieve the major scientific discoveries that will drive U.S. competitiveness, inspire America, and revolutionize our approaches to the Nation's energy, national security, and environmental quality challenges. | 1. 150 minutes. Improve overall response time to customer support requests.<br>2. 15.4 million node hours. Increase # of Node hours used by scientific users, achieving second-year target of 80% utilization of available HPCS-3 nodes, yielding 15.4 million node hours.<br>3. 95% Availability. Increase HPCS-3 availability, achieving second-year target of 95% availability. HPCS-3 will provide better availability than in the previous year due to improved system stability and operational processes.<br>4. 6,000 TeraBytes. Increase # TeraBytes available for archive of scientific data. |
| | Investment At Large | ORNL Leadership Computing Facility (OLCF)-Direct Mission | GOAL 3.1 Scientific Discovery – Achieve the major scientific discoveries that will drive U.S. competitiveness, inspire America, and revolutionize our approaches to the Nation's energy, national security, and environmental quality challenges. | 1. Annual user survey results show improvement in at least 1/3 of questions that scored below average in previous period. Satisfaction as determined through user survey.<br>2. Sustain or improve overall response time average. Time between receipt of user query (RT ticket) and initial response, in Business Hours.<br>3. Increase available hours to 360M (FY09 allocation). CPU hours allocated.<br>4. Sustain 85%. % of scheduled time that system is available to users.<br>5. Improve to 1000 TF (1PF). Computing capability. |
| | Investment At Large | SC Lattice Quantum ChromoDynamics Computing (LQCD) | GOAL 3.1 Scientific Discovery – Achieve the major scientific discoveries that will drive U.S. competitiveness, inspire America, and revolutionize our approaches to the Nation's energy, national security, and environmental quality challenges.<br>GOAL 3.2 Foundations of Science – Deliver the scientific facilities, train the next generation of scientist and engineers, and provide the laboratory capabilities and infrastructure required for U.S. scientific primacy. | Increase to 15.0 TF-Yrs. TF-Yrs delivered towards the completion of the 2009 Scientific Program.<br>1. 5% improvement over FY08 survey rating. Additional % of improvement in customer satisfaction rating (Customers rate satisfaction with the service provided on a scale of 1 to 10).<br>2. Increase to 35. Number of distinct users of the facility (includes DOE labs, LQCD and academic communities).<br>3. Increase to 95%. % of tickets closed within 2 business days.<br>4. Additional 10% reduction from baseline. % reduction of delivered node hours consumed by jobs (BNL, JLAB, and TJNAF) with an error exit status.<br>5. 100% to weekly scans (total of 52 scans per year). Increase the frequency of vulnerability scans on nodes visible from the Internet performed at each site.<br>6. Increase to 17.4 TF. Aggregate computing resources provided by the project expressed as an average of the Asqtad and DWF algorithm performances in Tflops.<br>7. Increase to 95%. % of average machine uptime at the Meta-facility. |

**Figure 15 - DOE Major Investments Mapped to DOE Strategic Plan Goals and Performance Measures (continued)**



| P/SO Name | Current FY 2008 Segment Investment is Supporting | Investment Name | DOE Strategic Plan Goals Supported by BY 2009 Investment | BY 2009 Strategic Plan Goal Target Performance Measures |
|---|---|---|---|---|
| Science | Investment At Large | ANL Leadership Computing Facility | GOAL 3.1 Scientific Discovery – Achieve the major scientific discoveries that will drive U.S. competitiveness, inspire America, and revolutionize our approaches to the Nation's energy, national security, and environmental quality challenges. | 1. 66%. Percentage of user problem reports addressed within 3 working days.<br>2. 400M. Number of CPU hours allocated to INCITE program projects in calendar year 2009 (in millions).<br>3. 20. Number of Science applications ready at 500 teraflops system acceptance to further early science results, under accelerated schedule.<br>4. 7. Increase Science Data Archive Capacity, in petabytes. |
| | Investment At Large | LBNL NERSC-Direct mission-M&O Cont. | GOAL 3.2 Foundations of Science – Deliver the scientific facilities, train the next generation of scientist and engineers, and provide the laboratory capabilities and infrastructure required for U.S. scientific primacy. | 1. Achieve user satisfaction score >= 5.25. Baseline score remains identical; NERSC improves annually by addressing low scoring items (5.0 or lower). The systems and applications the survey covers change as major new systems and software upgrades are implemented. User Survey Overall Satisfaction Score.<br>2. Address user problems at or higher than baseline, including problems related to new systems recently deployed. NERSC improves annually because the systems supported change as new systems and software upgrades are implemented. Percent of user problems that are addressed within 3 working days, either by resolving them or by communicating a resolution plan to the user.<br>3. Provide >= 725 Million CRHs for allocation. Number of Computation Resource Hours (CRH's) delivered.<br>4. Provide >= 30 Million SRUs for allocation. Number of Storage Resource Units (SRU's) delivered.<br>5. NERSC maintains a valid DOE C & A. DOE Certification and Accreditation (C & A).<br>6. Maintain major systems one year old or less at 90%, major systems between one and two years at 93%, and major systems more than two years at 95%. Parallel Systems Sch |

**Figure 16 - DOE Major Investments Mapped to DOE Strategic Plan Goals and Performance Measures (continued)**

## *5.2 EA Performance Outcomes:*

- Establish an integrated DOE EA that addresses the strategy and performance requirements of the Department's five strategic themes: Energy, Nuclear, Science, Environment, and Management Excellence
- Support for Department-wide integration initiatives
- Enhance investment decision making
- Improve mission performance

## *5.3 EA Performance Measures:*

- Architecture-based decision making is incorporated at the business-level to ensure that systems and infrastructure constantly evolve to exploit appropriate technology advances to best meet mission needs
- Investment business cases are supported by the EA and demonstrate its use in portfolio formulation
- Capture EA information in the DOE EA Repository to allow for Department-wide sharing across the enterprise
- Develop at least three Cross-Cutting Segment Architectures in line with the DOE EA framework

## *5.4 Additional Realized EA Benefits:*

An effective EA represents an organization from the highest level of its strategic direction down to the infrastructure that supports that purpose in a manner that is usable by decision-makers. An integrated EA Program provides a framework that enables investment and business process decisions along with information, knowledge and insight necessary for effective decision-making. When EA is performed effectively for the agency it allows the program managers to focus on mission-critical issues while the EA team works to identify smarter, faster, and integrated solutions that the programs may not have identified.

The EA also serves as a strong communication tool explaining and demonstrating the business and programs of DOE; identifying the missions and goals, the business processes required to perform their missions, the data required to enable these business processes, the applications required to manage the data, and the technology needed to support the overall programs.

DOE's EA Program helps senior leadership become more:

- Strategic Focused
- Risk Averse
- Performance Managed
- Decision Oriented

Overall, EA provides the structure and governance processes to foster collaboration across the enterprise to identify integration and shared service opportunities among common DOE mission elements. It is also an educational tool helping the IT community understand the business drivers for a program or business lines and their needs versus what is the next upgrade of the existing software. To this aim, the DOE EA Program continues to extend the use and usefulness of these innovations in business and technology transformation to support the DOE mission.

# 6 Additional Examples of EA Use at DOE

In addition to the work conducted directly by the DOE EA Program, there are many initiatives underway throughout the Department that support business and technology transformation to DOE. The Office of the Chief Information Officer supports these initiatives and works in partnership with the Department's programs to integrate them into the "to be" architecture to leverage best practices and integrate business and technology transformation achievements across the DOE enterprise.

## *6.1 EA at Office of Health, Safety and Security (HSS)*

The Office of Health, Safety and Security (HSS)[2] made great strides to support field activities by simplifying and reducing their workload in preparing, transmitting and amending applications for the Energy Voluntary Protection Program (DOE-VPP). The EA was used to enhance business process re-engineering activities, information flows, and application integration with the goal of improving safety and health performance across the DOE enterprise.

These efforts culminated in the development of a "web-based" application system that is being recognized as a best practice by other Federal and State agencies to leverage and share. This DOE-VPP initiative promotes improved safety and health performance through public recognition of outstanding voluntary safety programs; including coverage of radiation protection/nuclear safety and emergency management support due to the type and complexity of DOE facilities. This DOE-VPP provides several proven benefits to participating sites; including improved labor/management relations, reduced workplace injuries and illnesses, increased employee involvement, improved morale, reduced absenteeism, and enhanced public recognition. The DOE EA Program looks to recognize these business and technology innovations to leverage their best practice capabilities across the Department.

## *6.2 EA at Office of Science (SC)*

The Office of Science Enterprise Architecture (SC EA) program captures and maintains enterprise information regarding business objectives, strategies, and IT investments to provide business intelligence that assists in making decision about IT investments given limited resources, optimization requirements, and evolving science mission needs. The following states the SC EA program mission, vision and benefit to the SC:

> **Mission:** Provide business intelligence and decision support capability to facilitate high quality information technology stewardship in support of the Office of Science mission, vision, and strategy.
>
> **Vision:** Deliver the "gold standard" in enterprise architecture capability that is acknowledged by the Office of Science and across the DOE for providing superior business value.

[2] Office of Health, Safety and Security (HSS) was formed as a result of the merging of Office of Environment, Safety and Health (EH) and Office of Security and Safety Performance Assurance (HS) during September of 2006.

**Benefit:** The benefits of enterprise architecture are: (1) validates that IT investments are aligned to strategic goals and (2) providing business intelligence that can be used to optimize IT investments and resources across SC, ultimately allowing more funding to be applied directly to research.

In the near term the SC Enterprise Architecture (SC EA) Program is focused on three major objectives:

1. Implementation of the SC EA Information System
2. Integrated Information Technology Programs – CPIC, Cyber, and EA
3. Collaborative Development of the Federated DOE and SC Architectures

### 6.2.1 Implementation of the SC-CH Management Decision Support System (MDSS)

The Office of Science – Chicago Office (SC-CH) Management Decision Support System (MDSS) provides managers with capabilities for analysis and reporting of financial data, human resource data, assessment scheduling, workforce indicators, program/ project management and customer service levels of operation.

MDSS aggregates data from various and diverse systems such as Information Data Warehouse (IDW) and DOE Info and, through customized web interfaces, displays information in the desired reporting formats. The system interconnects with the Science Management Action and Records Tracking (SMART) system, the CH Information Portal (CHIP) and the Program and Project Management Application (PPMA) to retrieve and display warehoused data or documents relevant to the area of business under analysis.

By using industry-standard Oracle 9i database, Microsoft Internet Information Services (IIS) and IBM WebSphere technologies, the Chicago Office contained initial MDDS development costs to $184K. This approach eliminated the need to procure new software and hardware platforms, as well as the need to employ additional skill sets. Annual development and maintenance costs of $204K support initiatives for collapsing legacy applications into MDSS, expanding MDSS to other SC programs and offices, and the enhancement of existing functionalities.

Through subsequent development phases, the Chicago Office leveraged MDSS capabilities by collapsing the Chicago Financial Information System and the Training Registration System Reports legacy applications into the system. This resulted in a combined reduction of support costs for those systems by $230K annually.

MDSS provides services to eleven offices and the Office of Science Headquarters. Estimated costs for each office to develop and maintain a similar system are a combined $2.0M with annual recurring costs of $2.2M. If there were no further developments, in its current state through a conservative system lifecycle of five years, MDSS will save the Office of Science at minimum $26 million.

During FY07, the Integrated Assessment Schedule, which tracks scheduled assessments, was deployed to the following offices: ORO, PNSO, PSO, SSO, TJSO, and SC-HQ. In addition, Safety Charts was rolled out to all SC offices. Safety charts data includes Total Recordable Case (TRS) rate data and Days Away, Restricted, or Transferred (DART) case rate data.

Also during FY07, Rewards and Recognition functionality was collapsed into MDSS. Cost savings, compared to developing a stand-alone application, exceeded $50k. Ongoing support costs for this functionality declined as well.

### 6.2.2 Integrated IT Program Programs – CPIC, Cyber, and EA

SC recognizes the strong relationship between the capital planning, cyber security and enterprise architecture programs, and has instituted an effort to:

- Align the process activities of each program;
- Specify a consistent and cohesive set of data requirement (information calls) across these programs.

SC is working on this effort through a volunteer pilot program that includes Pacific Northwest National Laboratory (PNNL), Lawrence Berkeley Laboratory (LBL), Oak Ridge National Laboratory (ORNL), Jefferson National Accelerator Facility (JLAB), Oak Ridge Offices (ORO), and the Chicago Integrated Support Center (CH ISC). With CIO's from the pilot sites, SC EA hosted a panel at the 2006 Annual Information Management Conference (AIMC) to share with the DOE community accomplishments, lessons learned and future direction. Based on current accomplishments and budget reductions, SC EA is in the process of re-scoping efforts and determining how best to interact with the pilot sites to maximize progress during the remainder of the fiscal year. Figure 17 – Integrated Information Technology Approach depicts how these relationships are knitted together.

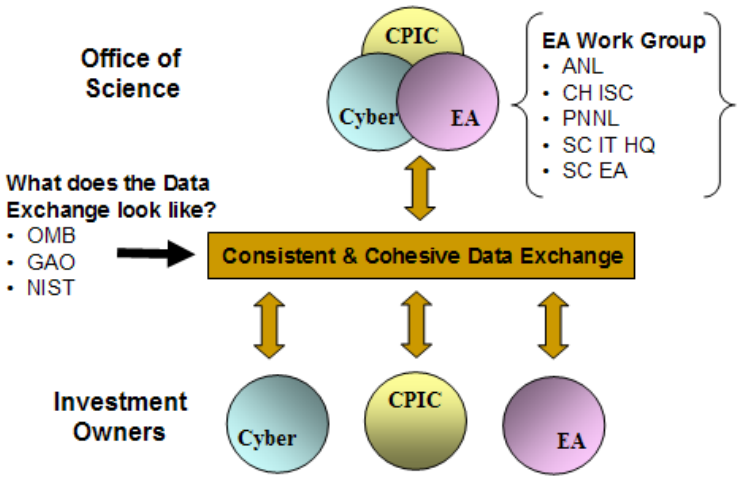



**Figure 17 - Integrated Information Technology Approach**

### 6.2.3 Collaborative Development of the Federated DOE and EA Architectures

The SC EA program is an active member in the DOE EA Working Group (EAWG), Strategic Portfolio Review Integrated Project Team, and the Architecture Review Board (ARB), and contributed extensively in the development of the FY06 and FY07 DOE work products.

## *6.3 EA at Office of Legacy Management (LM)*

The Office of Legacy Management (LM), received OMB's designation as a High Performing Organization in 2007. LM developed an Enterprise Management Plan for aligning their dynamic business environment with advancing technology in support of LM's strategic goals. The elements of analysis, design, implementation and maintenance of a successful enterprise strategy were incorporated; showing how each element supports a resilient infrastructure that allows enterprise-wide flow of information. Key objectives for implementing this plan are to realize the following benefits:

- Identification and adoption of appropriate information technology standards, minimizing dependence on specific suppliers of hardware or software
- Identification of opportunities to improve the relevance and adequacy of information provided and activities performed
- A technological infrastructure that will support the strategic business plan
- Increased integration of technologies, which improves the sharing of information across the organization and makes it easier to obtain information for changing decision-making needs
- Minimization of duplicate, and possibly inconsistent, data and processing capabilities within the organization's portfolio of investments
- Prioritization of projects to be implemented
- Program-supported performance gains
- Greater cost-justification of enterprise development and maintenance activities

This plan encompasses the necessary entities in defining LM's boundaries, governance, guidelines, and methodologies integrated into an enterprise environment lifecycle management approach. This lifecycle approach implements an evolutionary enterprise strategy that incorporates best practices and operates at maximum organizational efficiency. To achieve this, LM is implementing this plan through the stages of the Enterprise Architecture planning process as follows:

- Translating the strategic business plan into strategic information requirements
- Constructing business models based on identified strategic information requirements
- Constructing target architectures from the business models
- Creating a strategic implementation plan that specifies how the target architectures are to be implemented
- Conducting periodic reviews to ensure that enterprise management is achieving its intended objectives

This effort has resulted in LM being considered for Office of Management and Budget certification as a "High Performance Organization" and that consideration is still developing. Overall, the vision, strategy and tactical approach in this plan will provide a methodical approach and an appropriate framework for LM's decision-making process.

## *6.4 EA at Power Marketing Administration (PMA)*

A partnership was developed between Western Area Power Administration and Southwestern Power Administration to replace an old Unix-based commercial Supervisory Control and Data (SCADA) system with a personal computer-based SCADA and Automatic Generation Control (AGC) power control system. The new system provides additional functionality that meets recent requirements from the North American Electric Reliability Corporation for better alarming capabilities and also includes improved cyber security features.

The SCADA/AGC Power Control System (PCS) that is being shared between the two Power Marketing Administrations (PMA's) was originally developed by Western's Upper Great Plains Region (UGP) as a means to provide a backup for its own aging commercial software packages in the 1990s. By 2000, however, UGP management had decided that the in-house backup would become the permanent production system, and it has been maintained and enhanced as a Government-Off-The-Shelf (GOTS) solution since that time. In keeping with the intent of the President's Management Agenda for E-Government and as captured in the DOE EA, Southwestern decided to consider SCADA systems in use at the other PMA's for replacing their UNIX-based systems.

## *6.5 EA at Office of Chief Financial Officer (OCFO)*

The OCFO is the responsible element within the Department for the execution of the Integrated Management Navigation System Program (I-MANAGE). Launched in early 2003, I-MANAGE is a collection of projects that establish and provide corporate services across the entire Department. The I-MANAGE Program incorporates projects from three headquarters organizations (Office of the Chief Financial Officer, Office of Management and Office of Human Capital Resources) and provides cross-cutting services across all of DOE. The major Project investments of I-MANAGE consist of the following: Standard Accounting and Reporting System (STARS), I-MANAGE Data Warehouse (IDW), Corporate Human Resources Information System (CHRIS), Standard Budget System (SBS), and the Strategic Integrated Procurement Enterprise System (STRIPES). The I-MANAGE Program also includes other EA initiatives and projects that encompass and incorporate the characteristics and virtues of enterprise architecture that can be seen in the Business Support Services (BSS) Segment documents (link to be provided in final assemble of submission CD).

I-MANAGE is the Department's solution for managing enterprise-wide systems initiatives to achieve improved financial and business efficiencies, integrated budget and performance, and expanded electronic government in support of the President's Management Agenda. The program is in lock-step with the Departments Enterprise Architecture Program. Architectural efficiencies have been or are being achieved through I-MANAGE projects, some of the major achievements are described below.

**STARS** involved consolidating numerous Departmental accounting systems into single system – FY 2005.

**IDW** required improved business application data flow and usability by consolidating numerous data repositories and standardizing data elements – FY 2005.

**ETS** facilitated selection of and migration to one of three travel management solutions provided by GSA and OMB. This OMB initiative reduces the numerous travel management systems throughout the Federal government and is part of the President's Management Agenda (PMA) – FY 2006.

**STRIPES** is expected to be deployed early in Calendar Year 2008 and will consolidate numerous DOE headquarters procurement systems. In addition, STRIPES is designed to modernize the procurement function through electronic work flow. This initiative will save thousands of work hours of procurement processing and is part of the CIO's initiative to create a fully-enhanced enterprise architecture – FY 2008.

The **SBS** Project, when deployed, will consolidate numerous, non-automated, DOE budgeting functions into a single electronic budgeting system, saving thousands of labor hours in the formulation and execution of DOE's Federal budget – FY 2008.

The I-MANAGE Program optimizes the value of its systems to its customers and provides efficiency in operations through project integration and progress toward the target architecture. The I-MANAGE projects are integrated through common project documentation, component interaction and governance.

Current State Owner: The BSS Segment contains the core, enterprise-wide projects from the I-MANAGE Program, thus the owner of the BSS Segment is the I-MANAGE owner which is the Chief Financial Officer.

Charter: Because of the encapsulation of BSS by I-MANAGE, the Charter for the Segment corresponds to I-MANAGE's Charter. This charter has the following objectives:

- Support the accomplishment of the President's Management Agenda, which includes enhancement of human capital, integration of budget and performance, improved financial performance, and implementation of E-government
- Improve the efficiency & effectiveness of DOE's contract planning, placement, administration, and management
- Streamline and eliminate redundant processes
- Reengineer the business processes, as necessary
- Enhance the interoperability of the I-MANAGE systems
- Replace and/or reduce the number and diversity of legacy or proprietary systems
- Promote "one face to industry"

Governance: DOE has used EA, including the BSS Segment, to link DOE Strategy and the DOE Capital Planning and Investment Control (CPIC) investments into one EA Governance Framework. The Department's Strategic Plan identifies the priorities and key objectives of the organization. The plan outlines specific business results over time which drives the performance of the organization. The EA is a high-level roadmap for transforming how the organization operates. The Strategic Plan and EA outline portfolio management objectives for the organization. The CPIC process determines an optimal mix of investments and resource allocations to achieve organizational outcomes.

The BSS Segment governance process mirrors the Departments EA Governance Framework. Through coordinated processes, integrated project teams, and shared system data a segmented architecture approach is produced that, to date has been a progression toward a genuine business-driven EA. DOE's integrated governance process harnesses the segmented architecture approach so that it drives the CPIC process and improves executive decision-making.

Via the I-MANAGE Governance Structure, the Department is able to manage and monitor the BSS Segment through the enterprise transition strategy and IT investment project plans. The Governance Structure identifies issues with achieving the target architecture and develops plans to address them. The OCIO approves the Plan through the CPIC Quarterly Control Review Process. This provides the solid evidence of use of the architecture in the governance and management of the IT resources for the BSS Segment (*Federal Enterprise Architecture Program, EA Assessment Framework 2.2, October 2007, and page 16*). Figure 18 – I-MANAGE Governance Structure shows a graphic depiction of the I-MANAGE governance structure process.

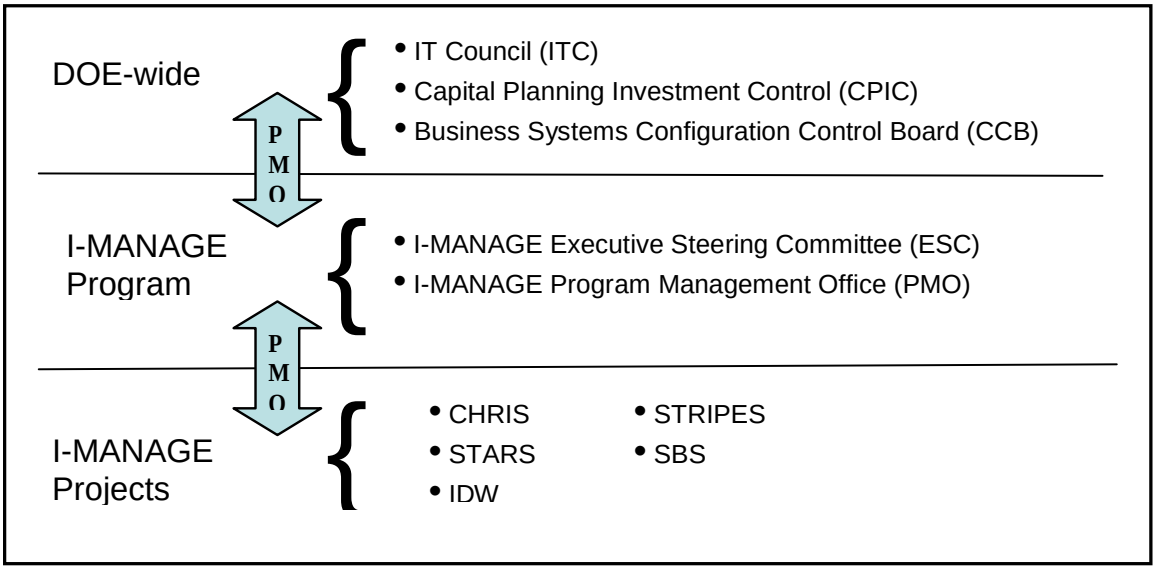



**Figure 18 - I-MANAGE Governance Structure**

As part of overall Governance, the I-MANAGE Program Management Office (PMO) provides specific direction and oversight for each individual project within the I-MANAGE Project Portfolio to ensure that these guidelines are used as the basis for effective, efficient project management, planning, execution, control, and closing. Project integration and integrated project change management processes ensures that elements within the project are properly coordinated, and within the broader I-MANAGE vision and the BSS Segment Architecture. This ensures multiple projects are executed concurrently and are properly coordinated and integrated. As a mature segment, BSS is a key element of the DOE Strategic Plan Theme #5: Management Excellence. BSS aligns with the annual cycle for DOE's EA and CPIC Activities as described in the Departments EA Governance Framework for both the current and future state for an organization's strategy and performance. This helps to identify the need for particular investments and provides important information for the development of investment business cases. Investment business cases then proceed through the formal CPIC process and upon approval, investment implementation begins.

Through effective governance, led by the Department's OCIO, and implemented through the I-MANAGE Governance Structure, change management, deployment, collaboration and reuse, and integration of IT investments are achieved for the business areas supported by the BSS Segment through the Departments' CPIC process.

### 6.5.1 Current BSS Segment Overview

These core subsystems of the I-MANAGE program define the scope of the BSS Segment Architecture and consist of:

- CHRIS: The Corporate Human Resource Information System is the human-resources component of I-MANAGE
- STARS: The Standard Accounting and Reporting System is the financial management component of I-MANAGE
- IDW: The I-MANAGE Data Warehouse component is the enterprise-reporting facility for I-MANAGE
- STRIPES: The Strategic Integrated Procurement Enterprise System initiative is the procurement and financial assistance component of the I-MANAGE program
- SBS: The Standard Budget System is the budget formulation and execution component of I-MANAGE

## *6.6 Additional EA Activities at DOE*

The DOE EA Program is working with several other initiatives to share best practices, lead collaboration efforts and continue transforming the business and technology environment across the DOE enterprise, including the following:

- Functional Accountability – Cross-organizational working group to collaborate on Financial, Human Capital, IT, Legal Procurement, and Public Affairs functional processes
- Geospatial Science Architecture – Proposal for developing a Geospatial Emergency Management shared solution to provide critical disaster response to ensure safety and continuity of corporate-wide internal and external operations
- Cyber Security Strategic Plan – Strategic Goals that support and secure the mission of DOE
- Most Efficient Organization – Realizing efficiencies and cost savings from A-76 collaboration services
- Enterprise Collaboration Services – Implementing consolidated server utility hosting environment for scaled capacity, shared storage and service oriented architecture
- Capital Planning & E-Gov Reviews – Providing the program discipline to ensure that major mission and technology investments, such as I-MANAGE, are funded and meet milestone targets for mission success

## *6.7 EA Driving Transformation*

DOE commenced significant new segment architecture work in 2006 as a result of ongoing segment analysis and prioritization efforts. With each successive segment architecture that DOE develops and implements, the overall Target EA has become more clearly defined and more readily achievable. Similarly, each successful segment architecture development helps clarify the process and ease the transition for subsequent segment architectures. Thus, DOE uses segment architectures to effect positive change both within the respective segment and across the business as a whole.

Through describing the work of the Department in component pieces, segment architectures provide a clearer understanding of how the organization can be structured to more effectively achieve its goals and ultimate mission. By identifying appropriate metrics and accurately measuring the impacts of architectural efforts on business operations, DOE is able to realize, and inform stakeholders of, the benefits of segment architectures, and thus of EA as a whole. With each segment architecture implementation, stakeholders in other segment areas become aware of the benefits they could obtain from conducting similar efforts. Through the use of EA artifacts and lessons learned from previously implemented segments, stakeholders in other areas are more able to move forward with their own segment architecture analysis. Additionally, as all segments within the Department should align with the Target EA and one another, successful segment implementations in one area help drive the desire, support, and resources necessary to perform similar efforts within other segment areas.

Fundamental to DOE's ability to effectively achieve its Target EA is an understanding of the specific steps that are included in the segment architecture development process, detailed in Figure 19 – Segment Architecture Development Process below.

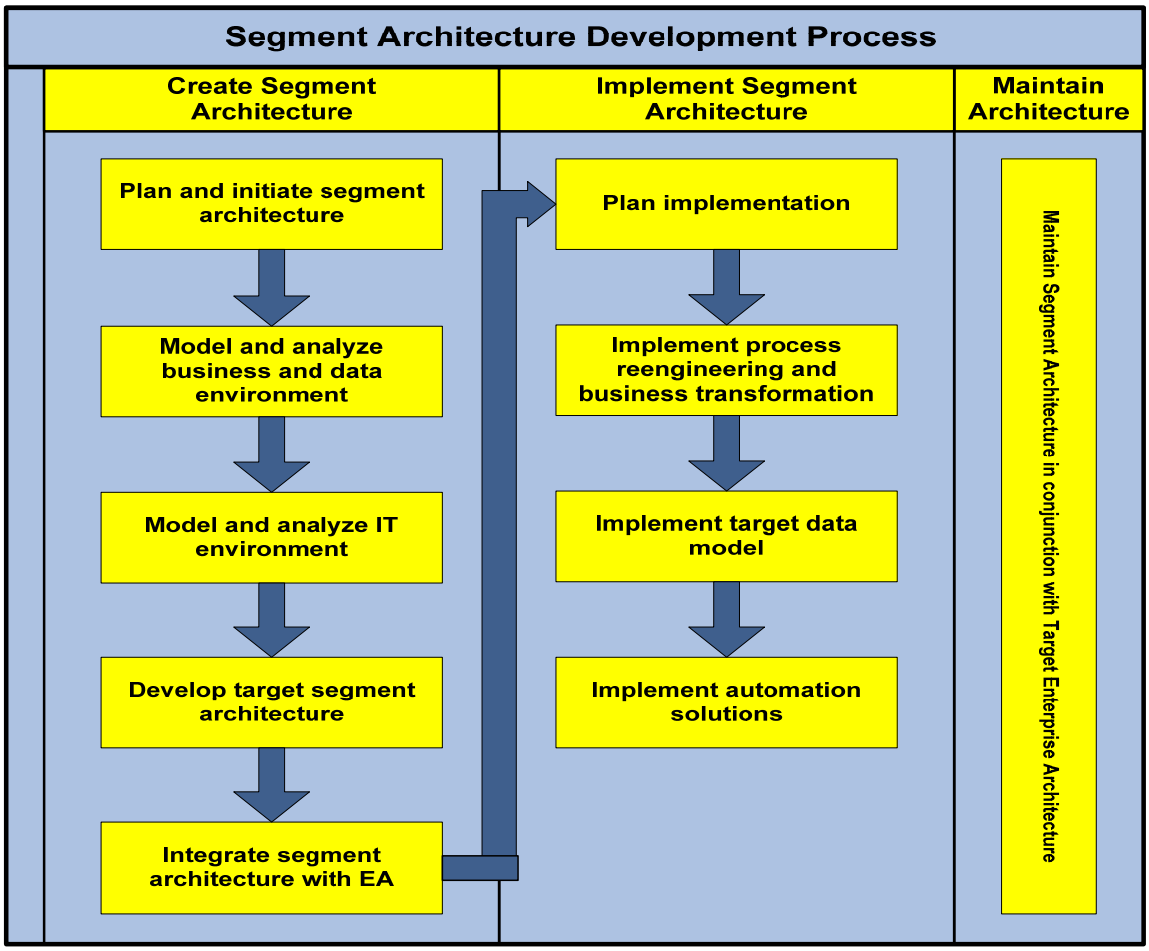



**Figure 19 - Segment Architecture Development Process**

The critical components of the Segment Architecture Development Process are described below.

**Plan and Initiate Segment Architecture** - Commence data gathering efforts to properly define the segment, the goals and objectives of the effort, the stakeholder population, and the resources to accomplish the identified tasks.

**Model and Analyze Business and Data Environment** - Ensure that the segment under analysis is fully understood in the greater business and data context, and that the business requirements and expected results of implementing the segment architecture are logically determined and in alignment with the DOE Target EA.

**Model and Analyze IT Environment** - Ensure that the technology necessary to provide the automation capabilities defined by the segment architecture is either in place, or that any

technology that is built or purchased to address the implementation effort is in alignment with the target architecture.

**Develop Target Segment Architecture** - Design and develop the optimal segment architecture solution based on the goals and objectives of the segment, the resources available to support the work, and knowledge of the underlying requirement to align the segment architecture with the greater DOE Target EA.

**Integrate Segment Architecture with EA** - Create or update existing segment architecture artifacts based on the performed work, seamlessly integrating the segment architecture into DOE's overall Target EA.

**Plan Implementation** - Conduct appropriate planning efforts to ensure that all implementation tasks and interdependencies are appropriately identified in the project plan, that mitigation/avoidance measures are defined for all known risks, and that relevant metrics are in place to effectively gauge the progress and success of the segment architecture deployment effort. In addition, ensure that stakeholders are effectively educated about the segment, that all functional requirements are correctly captured, that a sound business case exists in support of the effort, and that the overall implementation plan is optimally designed.

**Implement Process Re-engineering and Business Transformation** - Carry out the tasks identified in the previously created project and program plans while regularly measuring progress to ensure the effective alignment of people, processes, and technology to the Target Architecture. Ensure that appropriate management, oversight, and governance processes are in place, and that results are appropriately measured to monitor and control the overall implementation.

**Implement Target Data Model** - Ensure that segment architecture data is standardized, integrated with existing data services, and in alignment with the Target Architecture.

**Implement Automation Solutions -** Conduct implementation activities for any automation solutions that have been identified to satisfy the segments defined technology requirements. Test to ensure optimization of created solutions. Update all artifacts to reflect automated solutions.

## *6.8 Integration of the Department-Wide EA Knowledge Repository (EA Portal)*

The Enterprise Architecture Knowledge Repository is available using a web interface directly by DOE internal stakeholders of the EA Program and provides structured content management and access controls appropriate to the EA Program as seen in the image below of the EA Portal Home Page, accessible to EA stakeholders. Configuration management (CM) of the DOE Enterprise Architecture (DOE EA) Program entails the use of the Office of the Chief Information Officer (OCIO) Portal, the DOE Enterprise Architecture Repository (DEAR), DOE EA Portal and any other method for developing, maintaining, storing, tracking, etc. artifacts of the DOE EA Program. A sample EA Portal home page is shown in Figure 20 – DOE Portal.

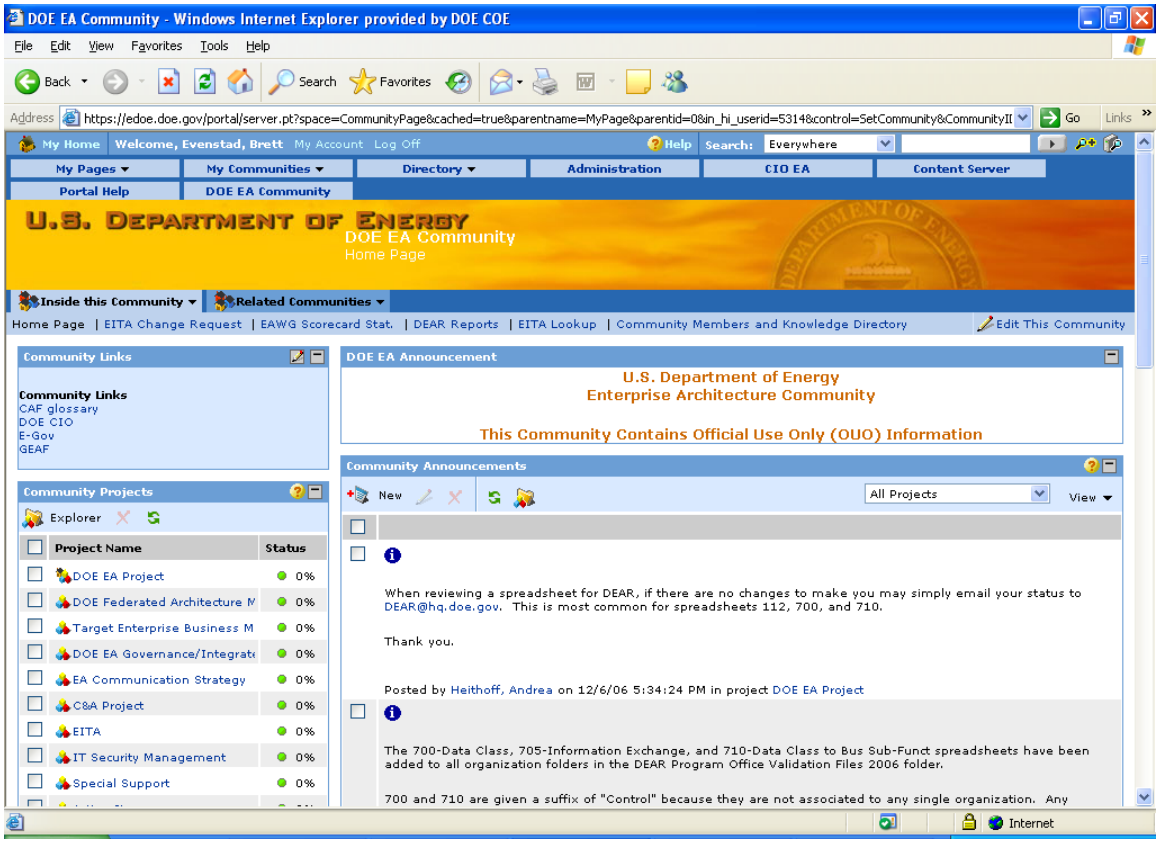



**Figure 20 - DOE Portal**

The OCIO Portal is used to retain DOE EA document artifacts, including DEAR documents. The Portal contains two DOE EA communities which are described below.

**CIO EA** web pages serve as an archive for historical DOE EA documents and DEAR Official Use Only (OUO) documents. Only the existences of the historical plans are tracked. DEAR documents are tracked under the DEAR CM Plan. This community is only accessible by OCIO EA staff.

**DOE EA** Community web pages contain the most current DOE EA documents being used for defining and managing the DOE EA. Some of the documents in this community contain background or office-specific information and will only be tracked in regards to their existence. A selected set of documents in this community will be identified and tracked for changes. This community is only accessible by DOE EAWG members.

**DEAR** is considered an artifact of the DOE EA Program. However, a separate CM plan is getting started so it can be used to manage DEAR and its associated documents because of its "Official Use Only" (OUO) status. Only those within the DEAR team and OCIO DOE EA Program staff have a need-to-know and access to these documents. The DEAR documents will also be included within the application, in a secure location, to ensure easy accessibility for the DEAR team and also as a backup for the master copies retained on the OCIO Portal.

In addition, the OCIO will maintain a library of master file copies of specific DOE EA Program documents with the prime contractor to serve as a backup repository for those on the Portal in the event they are removed or the Portal is destroyed and not recoverable.

User guides for navigating around the OCIO Portal are available under "Portal Help" in the eDOE Portal User Guides Project and under "Directory" in the Portal User Resources folder. The Portal is a secured site at https://edoe.doe.gov and potential users must get access via the Portal Administrator.

In order to get access to the Portal, go to https://mis.doe.gov and click on the button to request access. Complete the information requested. For SPONSOR, enter the name of the Chief Architect and then submit the request. The request is forwarded to the Chief Architect for approval. Once approved, setup instructions are sent to activate the DOE USERID. Next, the potential user should send a note to CSC.Helpdesk@hq.doe.gov requesting access to the Portal.

Although the Portal has restricted access, some of the documents stored on it are OUO and, as such, must be protected whenever there is a possibility that others who do not have a need-to-know could have access. Therefore, care must be taken to ensure that when accessing the website or downloading or printing OUO documents, it will be protected in accordance with the OUO instructions, as defined in DOE O 471.3, Identifying and Protecting Official Use Only Information, and the guidelines in DOE M 471.3-1, Manual for Identifying and Protecting Official Use Only Information. Additional information is available in DOE G 471.3-1, Guide to Identifying Official Use Only Information.

## *6.9 Support for EA Training*

A series of Enterprise Architecture training workshops for each DOE agency will provide instruction on how to use EA in the investment decision process, the benefits of using EA and, most importantly, requirements for the use and documentation of EA at each stage of the System Development Lifecycle (SDLC). These familiarization and training workshops will include EA case studies. In addition, training workshops and other communications vehicles will be offered to help Program Secretarial Offices use Enterprise Architecture in decision-making and toward preparation of the EA sections of the Exhibit 300's.

The following three training areas are being developed:

1. Introductory – An introduction to EA benefits/goals/objectives and an overview of EA methodology to those who will be responsible for ensuring EA accountability and performance on a daily basis.
2. Governance – Governance training will assist with establishing the Governance necessary to make the Department's/Agency's EA a success and a platform for managing change. Within this training is a demonstration of how the Department's architecture interacts with the SDLC, the CPIC process, and security guidelines. Program Secretarial Offices will also receive guidance on their specific involvement (roles and responsibilities), Department requirements and the timing of those requirements, and scheduled deliverables. The EAWG and ARB contribute

extensively to this development and execution along with the Program Secretarial Offices and the Field Offices.

3. EA Development – Participants will receive specific EA development guidelines which will include artifact definition and development, tool integration, and specific guidance with regards to what is being developed at the Department-level.

The first modules will be for the target audiences for the introductory level of enterprise architecture training, includes those with 3-5 years combined experience with program/project management, IT analysis, systems/SDLC development, or EA development experience. This group of individuals has provided oversight of EA artifact development from the perspective delineated in Clinger-Cohen Core Competencies. Examples of such individuals include:

- Department and Agency Business and IT Project Team Members
- DOE Project and Program Managers
- SDLC Process Managers (CPIC, Security, Budget, Standards, etc.)
- DOE Executive Managers

DOE Introduction to Enterprise Architecture Training will provide an overview of the following concepts:

- EA Concepts Overview on Goals, Objectives and Benefits
  - Introduction of EA-related legislation and an explanation that EA is a government-wide effort mandated by OMB and various regulations
  - Overview of EA Benefits - an explanation of what EA can do for their projects and how it can improve their performance in their efforts
- EA Methodology Overview
- DOE EA Process and Approach
- Introduction to the EA Tool and Repository – what's been done, how the tool will be used by the DOE project teams
- Introduction to EA Structure and Templates; including what forms are needed and how they are to be used
- Introduction to FEA Reference Models and their use within DOE with demonstrations of each for DOE use
- EA Best Practices and Resource Guidance with the Federal and Industry Community