

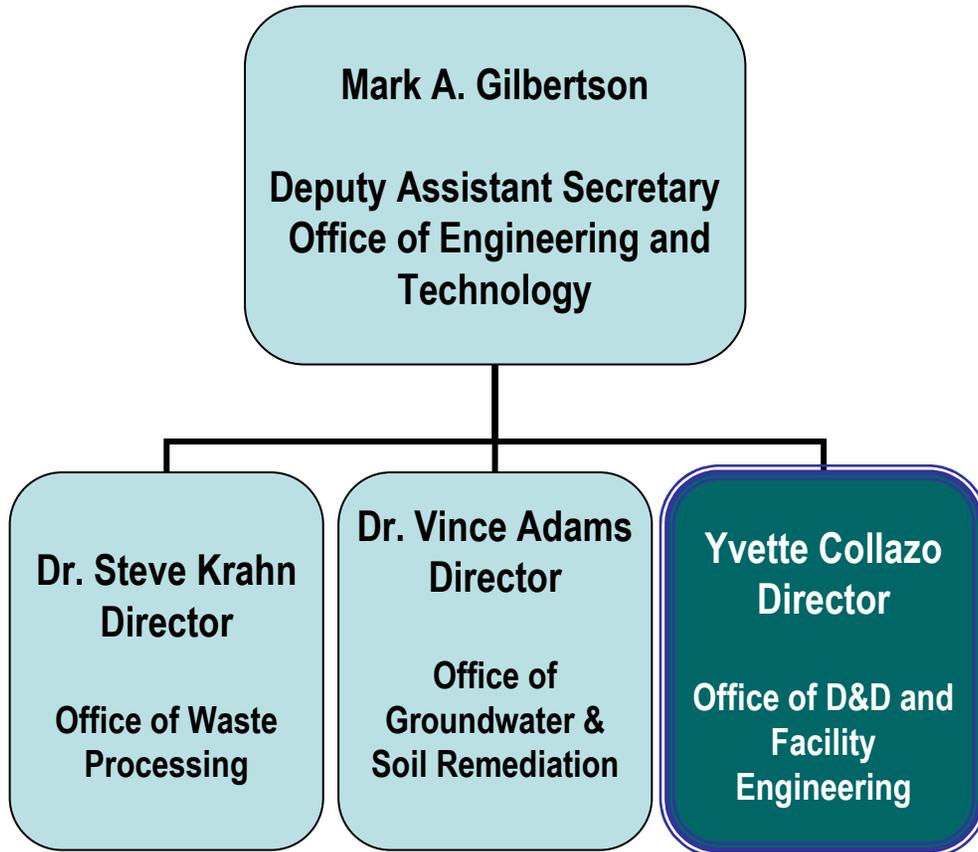
# Deactivation & Decommissioning and Facility Engineering

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# EM Office of Engineering and Technology

Office of Engineering & Technology was created to reduce technical risk and uncertainty for the Office of Environmental Management



## Functions

- Develop policy and guidance in all program areas relative to the EM mission
- Assess projects and programs through technical reviews and oversight
- Provide technical assistance and support to the field and other headquarters offices
- Manage the EM Technology, Development and Deployment Program

# Deactivation & Decommissioning and Facility Engineering

## **Mission**

Provide technical assistance and the timely insertion of need-driven innovated technical solutions to EM's baseline Deactivation and Decommissioning (D&D) activities and to optimize remaining EM real property assets and energy efficiencies in support of ongoing operations.

## **Vision**

Engineering and technology initiatives will provide the engineering foundation, technical assistance, innovative approaches, that contribute to significant reductions in risk (safety, health, and environmental), cost, and schedule for completion of the EM mission.

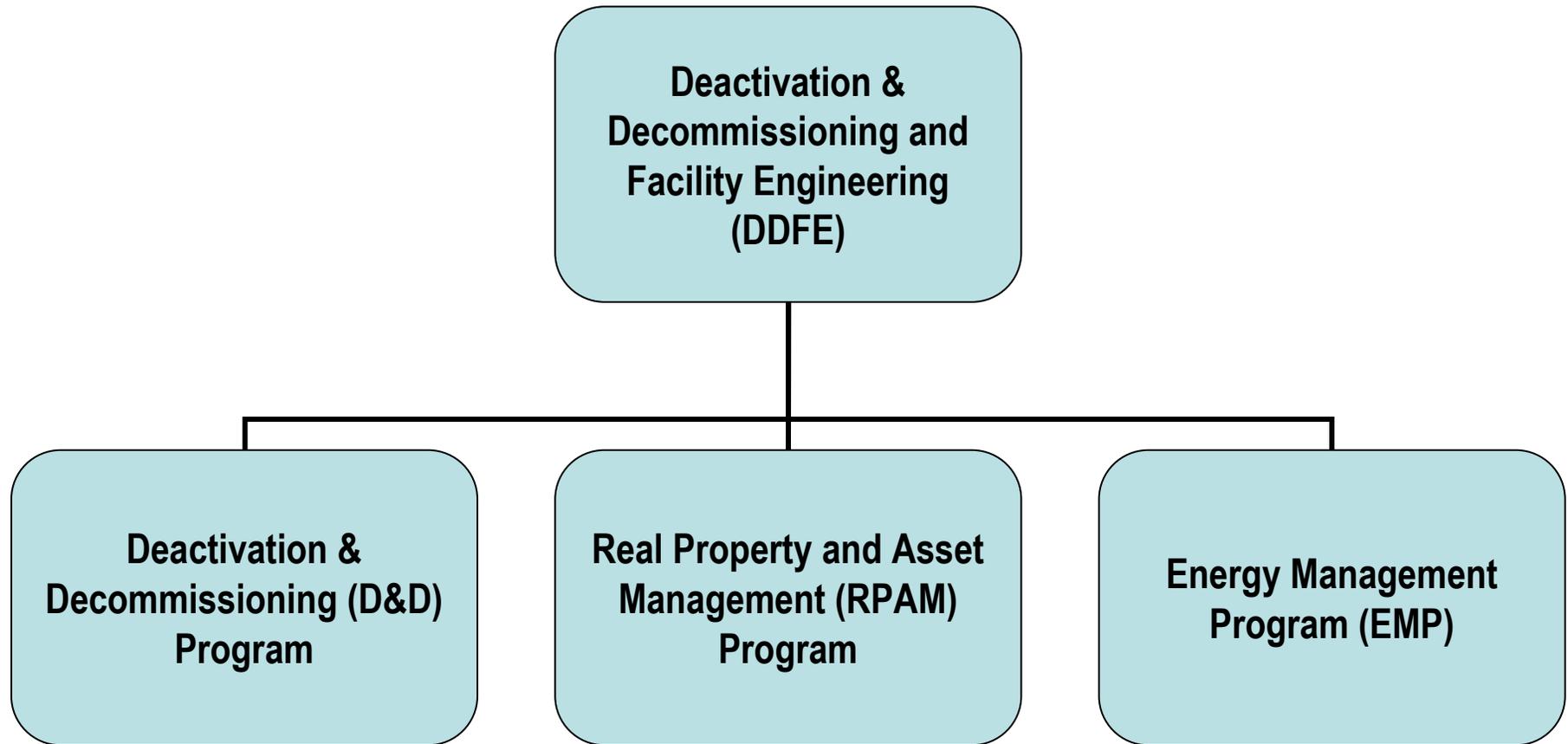


**EM** *Environmental Management*

safety ❖ performance ❖ cleanup ❖ closure

[www.em.doe.gov](http://www.em.doe.gov)

# Deactivation & Decommissioning and Facility Engineering



# DDFE: Deactivation and Decommissioning

## D&D Strategic Initiatives

EM's Engineering and Technology Roadmap (March 2008) and Integrated Multi-Year Program Plan (March 2008) identified Technology Development and Deployment (TDD) Strategic Initiatives for Deactivation & Decommissioning (D&D) by:

- Characterization
- Deactivation, Decontamination, and Demolition
- Closure



# DDFE: Deactivation and Decommissioning

## D&D Strategic Initiatives (continued)

### Technical Risk and Uncertainty

#### **Characterization**

- Limited techniques for detection, quantification and localization of penetrating radiation, radioactive contamination, chemicals, and biological contaminants increase the risk of personnel exposure to hazardous conditions.

#### **Deactivation, Decontamination, and Demolition**

- Hazardous conditions involving radionuclides, heavy metals, and organic contaminants result in worker safety issues and lead to use of cumbersome PPE and D&D approaches.
- Inadequate historical knowledge of past operations and contamination drive conservative and costly D&D approaches.

#### **Closure**

- End-state requirements for D&D of process facilities are not adequately defined.

### Strategic Initiatives

#### **Adapted Technologies for Site-Specific and Complex-Wide D&D Applications**

- Develop and deploy improved characterization and monitoring technologies for detecting and quantifying penetrating radiation, radioactive, and biological contaminants.
- Develop and deploy improved deactivation, retrieval, size-reduction, and stabilization technologies that provide adequate personal protection and effectively achieve end-state requirements.
- Develop and deploy advanced remote and robotic methods to rapidly access and assay facilities to determine optimal D&D approach.



## DDFE: Deactivation & Decommissioning (D&D)

***D&D Prioritization*** - Maximizing the Benefit of the D&D Program by utilizing a systematic approach that:

- Identifies solutions which will prioritize the D&D technology needs and evaluate options;
- Facilitates decision-making while taking into account different end-users viewpoints;
- Delivers transparent and comprehensive output;
- Provides responsive, prompt, and decisive outputs if D&D risks or emergencies occur; and,
- Demonstrates how the D&D portfolio and projects contribute to the success of the EM program mission.



# DDFE: Deactivation & Decommissioning (D&D)

## D&D Program Project Accomplishments

- Determined Adequacy of Process Knowledge at various EM sites and developed best practices
- Oak Ridge D&D Toolbox Project – Technology Demonstration
- Evaluated INL Experimental Breeder Reactor II (EBR-II) Wash Water Treatment Technologies
- Created Independent Verification and Radiological Survey Lessons Learned & Program Plan
- Performed External Technical Review of Integrated Facilities Disposition Project





# DDFE: Real Property Asset Management Program (RPAM)

## RPAM Strategic Initiatives

The **Environmental Management Engineering and Technology Roadmap** (*March 2008*) and the **Integrated Multi-Year Program Plan** (*March 2008*) identified Strategic initiatives for RPAM. The overall goal of RPAM is to ensure sustainment for enduring EM facilities by:

- Funding maintenance for worker safety and health and mission readiness
- Identifying and implementing best practices and lessons learned from existing efforts
- Developing new tools and processes to mitigate risk and maximize performance and lower risks of real asset portfolios during D&D operations

# DDFE: Real Property Asset Management (RPAM)

## ***RPAM Prioritization - Maximizing the Benefit of the RPAM by:***

- Ensuring that facilities and infrastructure are ready to perform or support mission activities in a safe, reliable and economic manner project life-cycle ;
- Maintaining real property inventories to support assigned missions and objectives (114 sites with 4900 real property assets - 28% of DOE's assets);
- Tailoring real property assets directives and performance metrics to the D&D mission;
- Developing a comprehensive EM asset management plan that coordinates real property acquisition; utilization; maintenance and repair; recapitalization, disposition, and long-term stewardship;
- Documenting management plans, performance and budget requirements in Ten-Year Site Plans (TYSPs) or Closure Plans that are updated and approved annually;
- Providing planned performance data for DOE reports to the Office of Management & Budget (OMB); and
- Ensuring data quality of real property inventory records in DOE's Facilities Information Management System (FIMS)



# DDFE: Real Property Asset Management (RPAM)

## RPAM Accomplishments

- Completed EM's TYSP Submissions (FY2009-2018 planning years)
- Completed EM's FY2010 Integrated & Facilities Infrastructure Crosscut Budget
- Completed FY2008 Validations of EM's FIMS data records
- Completed EM's FY2009 Sustainment and Asset Condition Index Analysis for facilities enduring beyond FY2015
- DOE footprint reduction – EM disposed of more than 1,500 assets since FY2002
- Assisted the Office of Science (SC) to meet its new construction offset requirement at the Brookhaven National Laboratory (BNL) by transferring 10,843 gross square feet from EM's "Excess Facilities Bank" to SC and demolishing 10 EM facilities at BNL between 2003- 2007



# DDFE: Real Property Asset Management (RPAM)

## Challenge

Manage and monitor EM's real property asset database (FIMS) in conjunction with ten year site plan submissions and sustainment funding levels.

## Solution

Meet all real property asset management requirements in the Presidential Management Agenda, and ensure sustainment levels are adequate during D&D operations.

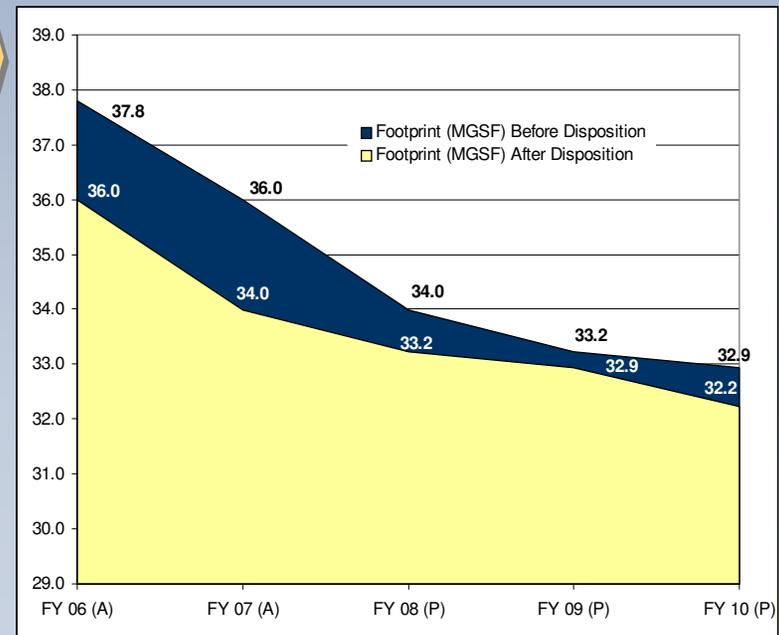
## Accomplishments

- In FY2008, EM leads all program offices at DOE in key performance indicators for real property assets.
- EM leads DOE in facility disposal FY2008 – 602K GSF & \$280M RPV
- More than 1,500 assets and 5.5 million square feet of facilities were removed from the inventory by demolition, transfer or sale since FY 2002.

## Impact

In FY 2008, the Department has avoided up to \$213M in lifecycle costs through property demolition and transfer, which helps:

- reduce cleanup work scope and lifecycle costs;
- promote facility reuse and reindustrialization; and,
- create thousands of jobs.



Footprint reductions of EM facilities from FY2006–2010



# **DDFE: Energy Management Program (EMP)**

## **EMP Strategic Initiatives**

**Transformational Energy Action Management (TEAM) Initiative** - Secretary Bodman's TEAM Initiative was designed for DOE to meet and exceed goals outlined in the Energy Policy Act of 2005 and Presidential Executive Order 13423 "Strengthening Federal Environmental, Energy, and Transportation Management". The **TEAM** (8) goals are:

**Goal (1) – Increase Energy Efficiency - 30% reduction in energy intensity OR reduce 3% annually by 2015**

**Goal (2) - Increase Renewable Energy - 50% of renewable energy consumption to come from "new renewable sources" (post 1998), use renewable energy 5% by 2010 and 7.5% by 2013**

**Goal (3) – Petroleum Reduction/Alternative Fuel Use (Fleet) - DOE will require its entire fleet to operate their Alternative Fuel Vehicles (AFVs) exclusively on alternative fuels (Applicable only to those sites with a fleet of more than 20 vehicles)**

**Goal (4) – Improve Sustainable Building Standards - DOE will establish energy efficient procurement and design standards**

**Goal (5) – Improve Water Conservation - Reduce water consumption in excess of 16% by FY2015 OR reduce water intensity by 2% annually**

**Goal (6) – Incorporate Sustainable Environmental Practices in Acquisitions**

**Goal (7) – Reduce Toxic Hazardous Material Use, Divert Solid Waste to Recovery, Increase Recycling Lead Program Office**

**Goal (8) – Reduce the Environmental and Energy Impact of Electronic Equipment**

# DDFE: Energy Management Program (EMP)

## EMP Strategic Initiatives (continued)

**Energy Park Initiative (EPI)** – DOE’s innovative concept to establish a process that facilitates the development, construction, and operation of industries compatible with DOE sites to benefit local communities by:

- utilizing site properties by the community and DOE to develop large scale energy-related facilities using technologies like wind, solar, biomass, nuclear power, desalinization, geothermal, natural gas, and hydro power.



## DDFE: Energy Management Program (EMP)

### ***EMP Prioritization - Maximizing the Benefit of the EMP by:***

- Continuing to emphasize importance of maintaining TEAM initiatives in any recapitalization and renovation activities that support infrastructure at EM sites;
- Assessing and promoting the use of EM's web-based sustainability assessment tool ensuring EM's assets are in compliance with federal, departmental, and program requirements related to energy management;
- Continuing EPI work at SRS and applying approach to other EM sites; and
- Identifying energy efficiency lessons learned and benchmarking from private sectors applicable to DOE site projects and facilities



# DDFE: Energy Management Program (EMP)

## EMP Accomplishments

- Savannah River Site implementation and start up of Biomass Cogeneration Project (operational September 2008)
- Implemented EM's web based sustainability assessment tool that help sites comply with energy efficiency and sustainable design
- Issued EM's Fuel Utilization Guidance to improve site monitoring of fuel use
- Achieved FY 2007 P2 EM Best-in-Class and DOE STAR Award winners
- Currently working SRS Community Reuse Organization to successfully implement EPI approach



# EMP: SRS's Energy Saving Performance Contract (ESPC)

## Challenge

Use the ESPC, an innovative contractual mechanism that helps federal agencies finance energy projects to meet energy and water conservation requirements in Executive Order 13423, DOE Order 430.2B, and the Transformational Energy Action Management (TEAM) Initiative.

## Solution

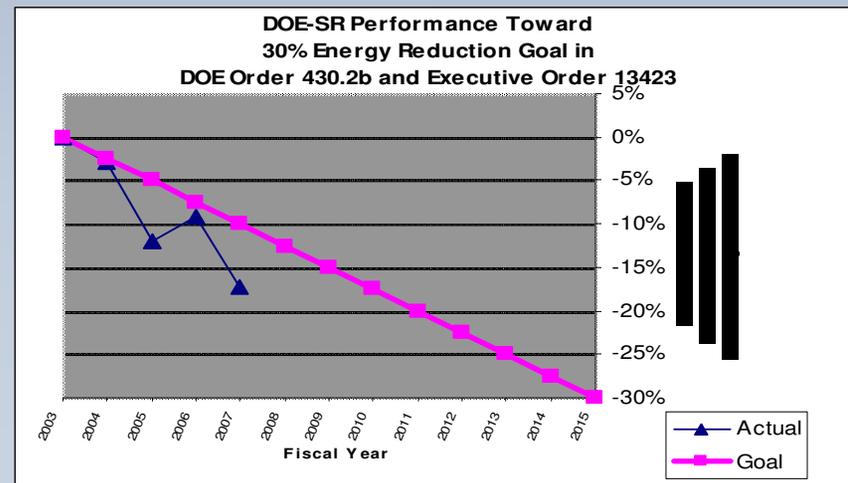
A site wide Energy Management / TEAM Council, consisting of membership from various organizations associated with implementing objectives cited above, was created to establish and assist ESPC implementation projects across the Savannah River site.

## Accomplishments

SRS has implemented many projects to meet its energy objectives. Additional activities will continue in FY2008 and FY 2009 to further enhance savings and reductions. SRS plans to develop new strategies for additional projects as deemed necessary.

## Impact – Energy Cost Savings

SRS completed two ESPC projects, both of which were recipients of federal awards. Construction of a new biomass (wood) steam generation plant is in progress for FY 2008 as part of a new ESPC which will result in nearly \$1.4M in annual cost savings to pay for the nine year investment while also providing a new replacement facility for the 50 year old plant.



Source: SRS Draft Executable Plan, August 2008



**EM Environmental Management**

safety ❖ performance ❖ cleanup ❖ closure

## Conclusion

- **EM's D&D Program** will continue to focus on innovative technology application; insertion of existing commercially available technologies and increase personnel safety and productivity into D&D projects while addressing D&D risks and challenges; and ensure the final end state of EM's assets is safely and effectively accomplished.
- **EM's RPAM Program** will continue to support EM's mission by ensuring that sustainment funding and planning will protect safety and ensure mission readiness, and reduce life-cycle costs for enduring real property assets.
- **EM's EMP** will continue to support all energy initiatives that reduce energy and water consumption, utilize sustainable technologies, and increase alternative fleet fuel sources while aligning all program activities with the Department's overall strategic plan to be the federal leader in energy, transportation, and environmental management; and implement EPI approach at other EM sites.