

DEVELOPING PERFORMANCE MEASURES FOR THE ENVIRONMENTAL MANAGEMENT PROGRAM

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ABSTRACT

The Office of Environmental Management (EM) has developed a set of corporate performance measures that demonstrate tangible environmental cleanup progress and results and provide a balanced approach to assessing program effectiveness and efficiency. These corporate performance measures are being implemented within the framework of the Department of Energy's (DOE) Strategic Management System and EM's Accelerating Cleanup: Paths to Closure blueprint for completing cleanup of contaminated soil, groundwater, and facilities; treating, storing, and disposing of waste; developing and deploying innovative technologies, and effectively managing nuclear materials and Spent Nuclear Fuel. EM has aligned the corporate performance measures around the program's vision and objectives and implements these same measures to plan, budget, execute, and evaluate key program and project activities. The EM corporate performance measures meet the intent and requirements of the Government Performance and Results Act (GPRA) and related legislation and communicate EM's most important environmental accomplishments to Congress, the Office of Management and Budget (OMB), and the public.

INTRODUCTION

The Office of Environmental Management (EM) is implementing an integrated approach to performance-based management that aligns the performance measures developed during strategic and annual planning with those used to budget, execute, and evaluate environmental cleanup progress and results. EM's approach to results-oriented management meets the intent and requirements of the Government Performance and Results Act (GPRA) and related legislation, and is helping to create a program that works better and costs less. This paper provides background information on the GPRA, which is the cornerstone piece of legislation for performance based management; provides an overview of EM's mission, outcomes, and activities within the framework of the Department of Energy's (DOE) Strategic Management System; defines EM's corporate performance measures, and how EM is using these measures to assess cleanup progress and hold managers accountable for results; and describes challenges, "lessons learned", and a path forward for further improvements in institutionalizing performance management throughout the program.

GPRA - THE MAIN LEGISLATIVE DRIVER FOR PERFORMANCE MEASUREMENT

In 1993, Congress enacted the Government Performance and Results Act (GPRA) to address the concern that many federal agency policies and spending decisions, as well as, Congressional oversight are seriously handicapped by a lack of well-defined program goals and performance information. Poor goal-setting, performance measurement and reporting has made it difficult for Congress to hold programs accountable for achieving intended results. Insufficient performance information has also hampered the efforts of Federal managers to improve program effectiveness and efficiency. The GPRA is intended to transform the way government operates by encouraging Federal agencies to increase their emphasis on the results and outcomes of projects rather than "inputs" or policy formulation. The GPRA emphasizes formal planning and quantitative measurement. Specifically, the GPRA requires that federal agencies develop the following:

- **Strategic Plan** - includes a comprehensive mission statement, general goals and objectives for major functions and operations, how the goals and objectives are to be achieved, how external factors could affect goal achievement, and how goal achievement will be evaluated. The Strategic Plan outlines the goals, objectives, and strategies that will shape future budgets and guide program execution.

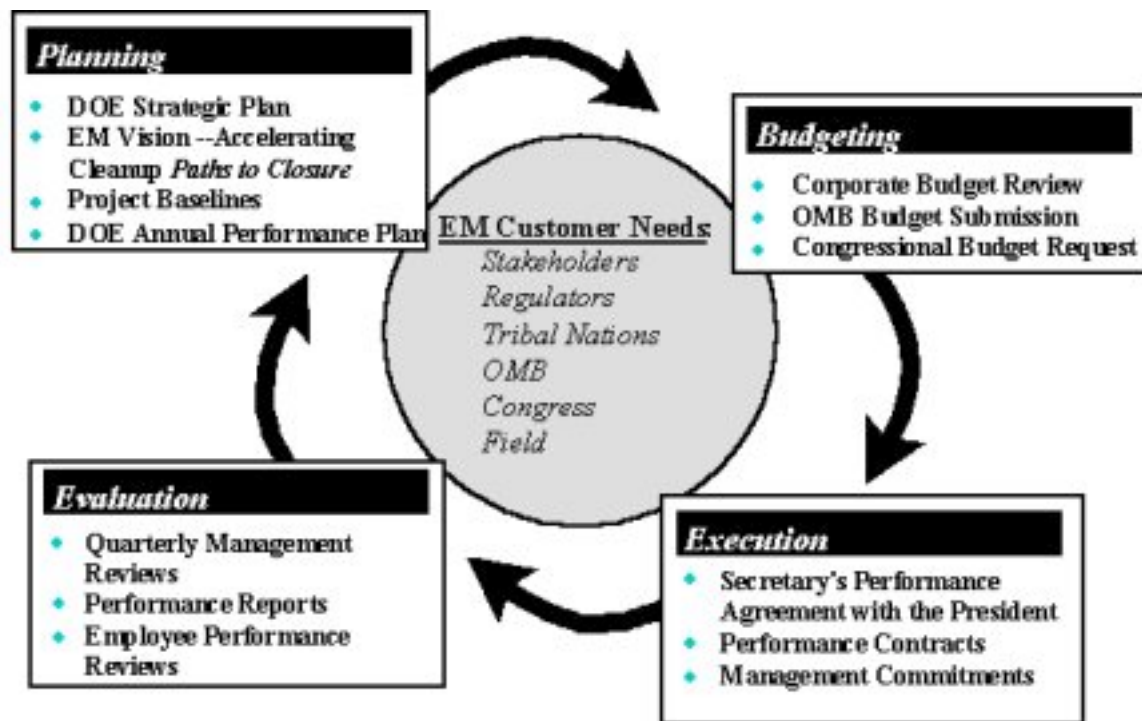
- **Annual Performance Plan** - includes performance goals (measures) that define the target of performance to be achieved by program activity for the fiscal year budget. It is closely linked to the long-term goals in the Strategic Plan. Specifically, the performance plan: (1) establishes performance goals that are objective, quantifiable, and measurable; (2) describes the resources required to meet those performance goals; (3) outlines how performance will be measured and compared to the goals; and (4) describes how the results reported will be verified and validated.

- **Annual Performance Report** - includes the actual results for the preceding fiscal year(s). The report includes an evaluation of the progress achieved toward the goals in the previous fiscal year(s) including why performance goals were not met, and plans for achieving established goals.

The EM program was a GPRA pilot from 1994 through 1996. In September 1997, the GPRA became "real" for all Federal agencies with the transmittal of agency Strategic Plans to OMB and Congress.

DOE STRATEGIC MANAGEMENT SYSTEM

The Department has established a Strategic Management System that links program planning, budgeting, execution, and evaluation. The Strategic Management System is the Department's framework and systematic process for implementing performance-based management and improving overall performance through gains in effectiveness, efficiency, and quality. The same core set of performance measures that are used to plan work are also used to budget resources, execute work scope, and subsequently evaluate program performance. The EM program is implementing its integrated system for performance management within the broader Departmental framework shown in Figure 1.



As an integral part of the planning process, the Department defines the long-term strategic goals for fulfilling DOE's missions and the expected levels of achievement defined by its near-term goals. During budget formulation, the Department formulates a performance-based budget by defining the resources required to attain stated performance levels and documents any anticipated impacts of increases or reductions to the budget. The Department executes against its budget allocation to attain the levels of performance specified for the budget and resources provided. As part of the evaluation process, the Department compares the actual performance achieved to planned performance levels, analyzes the resulting variances and information, and develops necessary corrective action plans. Performance measures provide the linkage between the processes of planning, budgeting, executing and evaluating. This concept of performance is cascaded through all of the Department's organizational levels.

BACKGROUND AND VISION FOR THE FUTURE

A key step in developing a successful performance management system is to ensure that the organization has a defined mission and results oriented outcomes. The EM program's vision, goals and objectives were presented in the *Accelerating Cleanup: Paths to Closure* report in June 1998. The program's vision focuses on cleaning up the geographic sites that were contaminated from over fifty years of nuclear weapons research, production, and testing from World War II through the Cold War.

The nuclear weapons complex generated large amounts of waste, including unprecedented volumes of contaminated soil and water, radiological hazards from special nuclear material, and a vast number of contaminated buildings. The scope of the EM program's responsibilities is enormous and includes facilities and sites in 20 states and one territory that occupy a total of about 2.1 million acres which is an area approximately equal to the states of Delaware and Rhode Island combined.

As such, EM is the largest cleanup program in the world with an annual budget of approximately \$6 billion.

The EM vision is stated as follows:

By 2006, the Environmental Management program intends to complete cleanup at most of its 53 remaining sites. At the 10 remaining sites, including our five largest sites, treatment will continue for the remaining "legacy" waste streams. This vision will drive budget decisions, the sequencing of projects, and the actions needed to meet program objectives. This vision will be implemented in collaboration with stakeholders, regulators, and Tribal Nations.

EM has made significant progress in cleaning up the Department's contaminated sites. Originally, 133 geographic sites nationwide required cleanup. (This number includes the Waste Isolation Pilot Plant, which is a disposal site, as well as, 21 Formerly Utilized Sites Remedial Action Program (FUSRAP) sites which were subsequently transferred to the U.S. Army Corps of Engineers for cleanup). As of the beginning of FY 1998, EM had completed cleanup at 60 geographic sites and 53 geographic sites remained to be cleaned up. The program's goal is to complete 43 of these 53 remaining geographic sites by 2006. For some sites, this goal is extremely aggressive and meeting this date will be a challenge. The EM program or the Department of Energy will not necessarily leave a site when cleanup activities at that site are considered complete. Rather, long-term surveillance and monitoring activities may continue even after active remediation is "complete"; at some sites these activities will continue beyond 2070.

Because cleanup of some of the geographic sites will not be completed for some time, interim cleanup progress is tracked by measuring the completion of key activities (i.e., environmental remediation, deactivation and decommissioning of facilities, treatment and disposal of waste, and stabilization of nuclear material and Spent Nuclear Fuel (SNF)).

EM ACTIVITIES ARE TIED TO CORPORATE PERFORMANCE MEASURES THAT DEMONSTRATE CLEANUP PROGRESS

EM has developed a single set of corporate performance measures that focus the organization on achieving the cleanup vision and goals of the program. Geographic site completion is the primary "outcome" measure for the EM program. The supporting activities and associated corporate performance measures gauge interim progress towards geographic site completion. EM has also established crosscutting measures of program effectiveness and efficiency relating to enhanced performance, stakeholder trust and confidence, and safety and health. To ensure a common understanding and consistent implementation of EM's performance measures across the complex, EM has established a uniform set of definitions for the corporate performance measures.

Outcome: Geographic Site Completion

The completion of EM's geographic sites is the primary "outcome" measure of the program. Geographic sites are areas which may encompass numerous projects and which have an identifiable site name recognized by stakeholders and DOE personnel. The Operations/Field Offices, in coordination with EM Headquarters, have established geographic site completion dates and corresponding completion dates for their projects and key activities. Even after completing cleanup, EM will maintain a presence at most sites to monitor, maintain and provide information on

the contained residual contamination. These activities are designed to maintain long-term protection of human health and the environment.

Mission-Oriented Corporate Performance Measures

EM's mission oriented measures cover major program activities and are used to assess progress towards completing cleanup of EM's geographic sites. EM has established annual and life cycle performance goals for the mission-oriented performance measures to assess overall progress towards completing key program activities and meeting planned geographic site completion dates. The annual and life-cycle performance goals are established by project and are aggregated to the "Site", "Operations/Field Office", and total EM levels. The key mission oriented activities of the program and the associated corporate performance measures are shown in figure 2 and are further described below.

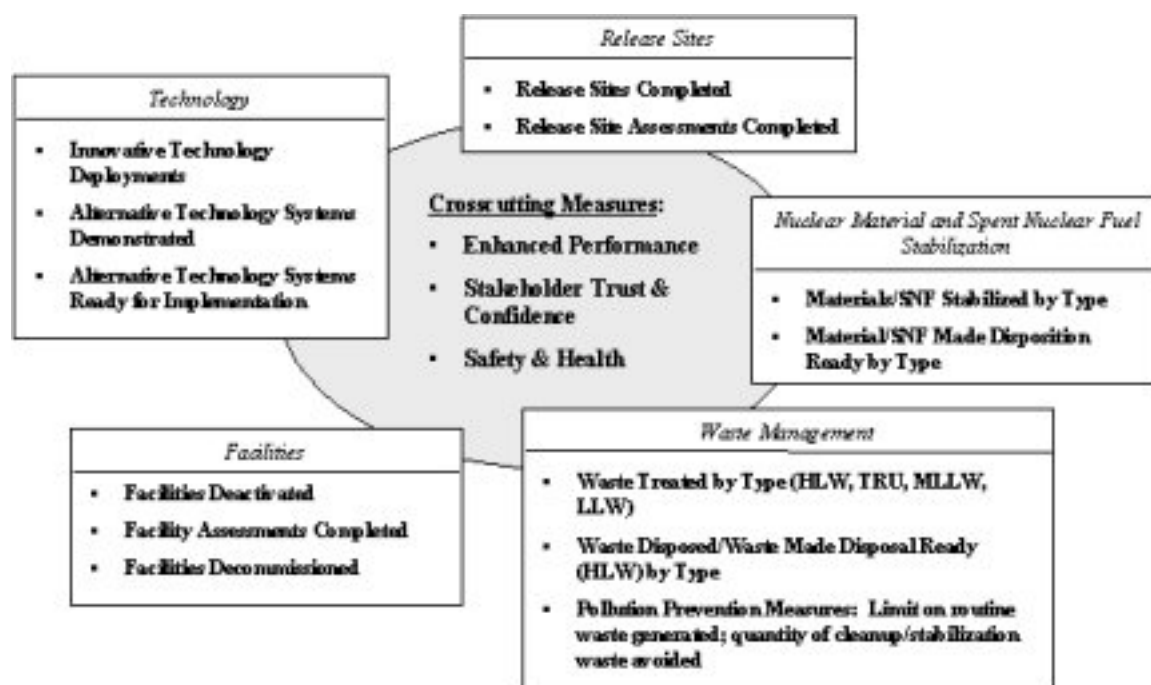


Figure 2 – Implementing GPRA

- Progress associated with the **cleanup of all releases to the environment** in accordance with agreed upon cleanup standards is measured by the number of: (1) Release Site Assessments completed;
- (2) Release Site Cleanups completed. Release sites represent discrete areas of contamination at a particular geographic site where releases or spills have occurred and contamination has been released to the environment. Remedial actions are taken to identify and contain or remove soil and groundwater contamination to prevent it from spreading.

- Progress towards completing the **deactivation or decommissioning of all facilities** currently in the EM program, excluding long-term surveillance or monitoring is measured by the: (1) number of facility assessments completed; (2) number of facilities deactivated; and (3) number of facilities decommissioned. Facilities are defined as identifiable contaminated buildings or

structures (and at times, a room or part of a building or structure). Deactivation encompasses activities where the intent is to minimize the risks, hazards, and associated costs at facilities and to make those facilities available for potential reuse or eventual decontamination and decommissioning. While these activities can include material handling and movement activities, the intent of deactivation is to remove the material with the goal of readying the facility/system for the preferred end state. Decommissioning involves the decontamination and dismantlement and removal of nuclear facilities that are no longer active and pose a risk to public health or the environment. The ultimate goal of decommissioning is unrestricted release or restricted use of the site.

- Progress towards **Nuclear Material and Spent Nuclear Fuel (SNF) stabilization** is measured by the quantity of nuclear material or SNF: (1) Stabilized; and (2) Made Disposition Ready. Nuclear materials include plutonium, uranium, or other nuclear materials (which are further subdivided into additional categories/units of measure). Stabilization encompasses activities where the intent is to convert nuclear material to a stable form suitable for storage, either safe interim, or long-term, depending upon the programmatic plans for the material. Stabilization means that something (processing from a liquid to a solid form, processing to remove activated waste streams, repackaging, etc.) must be done to the nuclear material so that it poses significantly less risk to the workers, the public, and/or the environment. Disposition Ready materials are prepared for transportation, long-term storage, or final disposition but cannot yet be transported until a final disposition location has been chosen.

- Progress towards the management and **disposal of waste** is measured by the quantities of: (1) Waste treated by waste type; (2) Waste stored (inventory) by waste type, and (3) Waste disposed by waste type. The types of waste included in EM's corporate performance measures include: High Level Waste (HLW), Transuranic (TRU) waste, Mixed Low Level Waste (MLLW), and Low Level Waste (LLW). Volumes of waste are measured in cubic meters with the exception of HLW disposal, which is measured in canisters.

- Progress towards **preventing future pollution** includes success measures for: (1) reducing routine waste generation by 50 percent by December 1999, based upon 1993 waste generation rates; and (2) reducing by 10 percent the waste resulting from the execution of cleanup, stabilization and decommissioning activities, from annual planned baseline volumes. EM also tracks the number of pollution prevention projects and the waste reduction resulting from these projects.

- Progress towards **technology development and deployment** is measured by the: (1) number of alternative technology systems demonstrated that meet the performance-specification based needs as identified by the Site Technology Coordination Groups; (2) number of alternative technology systems ready for implementation with cost and engineering performance data, and (3) number and type of innovative technology deployments. In the EM context, deployment is the use of a technology or technology system toward accomplishment of one or more site-specific Environmental Management program cleanup objectives as applied to actual waste requiring management at the site.

Crosscutting Measures

Measures for Safety & Health, Stakeholder Trust and Confidence, and Enhanced Performance crosscut the entire EM organization. EM's crosscutting measures are oriented towards measuring the effectiveness and/or efficiency of processes, as follows:

- **Safety & Health** measures include the EM Procedure Deficiencies and Violations; Lost Workday Case Rate; Total Recordable Case Rate; and EM ORPS Corrective Action Status, as follows:

- **EM Procedure Deficiencies and Violations** - This measure tracks the number of EM events involving a procedure violation, noncompliance, problem or deficiency as a root, direct, or contributing cause, or for which corrective action involves changes to or development of a procedure. The objective is to indicate potential problems in conduct of operations and process safety performance.

- **Lost Workday Case Rate** - This measure tracks the number of work-related injuries or illnesses that involve days away from work or days of restricted work activity, or both, per 200,000 hours worked. The goal is to improve occupational safety performance and reduce injuries and illnesses resulting in lost workdays or restricted work activity.

- **Total Recordable Case Rate** - This measure tracks the number of work-related deaths and illnesses, and those work-related injuries which result in loss of consciousness, restriction of work or motion, transfer to another job, or require treatment beyond first aid, per 200,000 hours worked.

- **EM Occurrence Reporting and Processing System (ORPS) Corrective Action Status** - This measure tracks the number of open corrective actions which have passed their initial target completion date. The objective of this measure is to indicate management commitment to promptly fixing deficiencies and Site/Operations Office performance in timely completion of ORPS corrective actions.

A team of field experts is working with EM's Office of Safety and Health to simplify data retrieval and processing for these S&H measures and to determine if they are still the "best" measures for today's needs. For example, 9 of 11 field organizations have demonstrated substantial improvements in ORPS Corrective Action Status and it may therefore be more productive to focus on another measure needing improvement.

- **Stakeholder Trust and Confidence** measures assess improvements to the timeliness and sufficiency of information released to the public. EM's measure include: (1) Responding to an estimated annual total of 500,000 public requests for information and documents from the Center for Environmental Management Information within an average of two business days per request; (2) Conducting stakeholder meetings to increase public involvement in crosscutting environmental quality issues, and (3) Conducting "Communicating with the Public" training sessions for DOE managers.

• **Enhanced Performance** - The Department will continue to seek "performance enhancements" as a means of reducing the significant costs of the cleanup program. By becoming more cost-efficient, the Department will be able to accelerate cleanup and closure schedules, and thereby lower life-cycle cleanup costs. In Paths to Closure, the Department identified several ways to enhance performance to improve productivity and/or accelerate site closure:

1. **Application of Technology Deployment** - EM will ensure maximum performance enhancement through the deployment of the right technologies by directly linking technology needs to specific project needs. As part of this initiative, EM will determine a nationally prioritized set of technology needs and specific cost savings opportunities;
2. **Integration** - Identifying better ways to transfer and manage waste among sites
3. **Reducing Support Costs** - Applying more funds to cleanup;
4. **Project Sequencing** -- Completing projects with high "upkeep" costs;
5. **Contract Reform** - Creating incentives for contractors to improve performance (quality results and accelerated completion), and
6. **Lessons Learned** - Increasing productivity based on lessons learned.

ALIGNING EM PROJECT STRUCTURE WITH PROGRAM GOALS, OBJECTIVES, AND MEASURES

Projects are the fundamental building blocks for planning, budgeting, execution, and evaluation. EM has organized all activities at its sites into more than 390 projects whose major characteristics are described in Project Baseline Summaries (PBS). The PBS contains the scope, cost, schedule, and performance measures information for each EM project. Sites are responsible for developing detailed project baselines for all field projects that present a clear definition of overall cleanup requirements, individual cleanup milestones, critical interactions between projects, and costs over time. Detailed information in the project's PBSs is aggregated to the Site, Operations/Field Office and total EM levels to provide a comprehensive picture of planned and actual results. Performance information at a total EM level may also be disaggregated to identify potential problem areas at specific EM sites or projects. The Paths to Closure report outlines the life-cycle scope, schedule, and cost for DOE's environmental cleanup program based on a roll-up of the more detailed information provided in the PBSs and other data. This same project-based information is also used to develop EM's Congressional Budget Request and to report planned and actual program results in a myriad of EM and Departmental planning and reporting documents.

KEY COMPONENTS OF EM PLANNING, BUDGETING, EXECUTION AND EVALUATION

EM is implementing a performance based management approach that is consistent with the framework of the DOE Strategic Management System, previously shown in Figure 1. Throughout the processes of planning, budgeting, execution, and evaluation, the EM program involves its

stakeholders, regulators, and the public to foster strong partnerships and integrate the public's perspectives into decision making.

- During *Planning*, EM defines performance objectives in terms of measurable results. At the highest level, the Department's Strategic Plan provides the broadly defined goals and objectives of the Department, including the DOE mission, goals, strategies and levels of success. The majority of the EM specific objectives and commitments are defined in the Environmental Quality (EQ) section of the DOE Strategic Plan. EM's project-based Paths to Closure is aligned with the DOE Strategic Plan and provides significantly more detailed near-term and life-cycle performance information. EM's stakeholders were involved in both the development of the Department's Strategic Plan and EM's Paths to Closure. The specific performance measures and targets for the fiscal year budget request are reported in the Department's Annual Performance Plan that is submitted with the Budget to Congress.

- During *Budget Formulation*, EM develops a budget that clearly demonstrates the measurable products, services, and outcomes that can be accomplished for the dollars that are being requested. Performance measurement information is an extremely important means for justifying and defending EM's budget to OMB, Congress, and our stakeholders. The EM program's previous budget account structure (e.g., Waste Management, Environmental Restoration, Nuclear Material and Facility Stabilization, etc.) has been revised to better align the budget structure with EM's Paths to Closure projects and performance measures. The new budget structure supports EM's geographic site closure objectives; maximizes field flexibility by lowering the number of Congressional Control points, and improves the integration of EM's performance measures with the budgets. Under this new budget structure, EM has established three program accounts to emphasize project completion and site closure schedules:

1. **Site Closure** - provides funding for projects at sites for which EM has established a goal of 2006 for site closure and afterwards where there will be no enduring Federal presence on site, except for stewardship activities.

2. **Site/Project Completion** - provides funding for EM projects that will be completed by 2006 at: (1) EM sites where overall cleanup will not be fully completed by 2006; and (2) DOE sites where all EM projects will be completed by 2006 except for long-term stewardship activities, but where there will be a continuing federal workforce at the site to carry out enduring non-EM missions, such as nuclear weapons support or scientific research and the necessary waste management to handle newly generated wastes from these missions.

3. **Post-2006 Completion** -- provides funding for projects that are expected to require work beyond 2006.

The EM corporate performance measures and goals were reported in the FY 2000 Congressional Budget Request for the budget window (i.e., prior year, current year, planning year) and life cycle to enable Congress and OMB to evaluate the work that will be accomplished for the resources requested.

- During *Execution*, EM executes to the performance measures and goals established in various Departmental and EM agreements and performance contracts, including the Secretary's Performance Agreement with the President, EM Management Commitments, and Field/contractor performance contracts. To institutionalize accountability for results, the Assistant Secretary for Environmental Management (EM-1) establishes and signs fiscal year "Management Commitments" with each Operations/Field Office manager that are comprised of EM's corporate performance measures, high visibility project milestones, site critical closure path milestones, and other major milestones. The Operations/Field Offices execute their work scope against these management commitments and their project baselines.

- During *Evaluation*, EM tracks, analyzes, and reports its performance status and results against its commitments during *Quarterly Management Reviews (QMR)* and in various Departmental and EM year-end performance reports. The EM corporate performance measures are aggregated by PBS to the site level, and to the Operations/Field Office level, to a total EM level to provide a complex-wide assessment of program results. At each level of the organization, performance commitments are tracked, evaluated and interpreted to assess program effectiveness. Reviewing and evaluating performance results is an important means for enhancing accountability and enables managers to improve program performance. Reporting results also interjects some discipline into the system for collecting and reporting data. Explanations for significant variances between the actual performance results and what EM committed to accomplish in the previous Congressional Budget Request are also reported for each Operations/Field Office. Fiscal year results are used as input to the planning and budgeting processes and to justify EM's future budgets.

HOW PERFORMANCE MEASURES RELATE TO EM'S USE OF EFFECTIVE SCIENCE AND TECHNOLOGY

Investments in science and technology support the EM program's goals to accelerate cleanup, reduce risk, achieve or reduce life cycle costs, and provide solutions to technical problems that must be resolved to complete the cleanup mission. The following four objectives for science and technology investments were established to support the EM program's cleanup mission and the science and technology vision:

SCIENCE & TECHNOLOGY VISION

Science and technology investments will provide the scientific foundation, technical assistance, new approaches, and new technologies that contribute, as an integral part of EM programs, to significant reductions in risk (both technology and safety and health), cost, and schedule for completion of the EM mission. The strongest advocates for investing in science and technology activities will be the EM cleanup project managers.

- Meet the highest priority cleanup project needs, including those on the critical path to site closure and those representing major technology gaps in project completion;
- Reduce the cost of EM's costliest cleanup projects;
- Reduce technology risk (i.e., the programmatic risk that critical cleanup activities will not be completed on time or within budget due to a technology deficiency), and,

- Accelerate and increase technology deployment by bridging the gap between development and use.

The responsibility for science and technology, from research through deployment, is centralized within six "Focus Areas" that concentrate on the following waste type problem areas: Mixed, Low Level and Transuranic Waste; High Level Waste; Environmental Restoration; Deactivation and Decommissioning; Nuclear Materials; and Spent Nuclear Fuel. These Focus Areas were established as national programs to address the diverse needs of EM's sites and to balance the investment distribution between research and deployment and across the waste type problem areas. The Focus Areas primary role is to work closely with the site cleanup project managers to identify science and technology requirements and solve specific technical problems. The Focus Area approach fosters communications between the cleanup project managers and the scientists that are developing cleanup solutions and is expected to result in fully integrated multi-year responses to EM's science and technology needs.

EM's Corporate Performance Measures for Science and Technology

The science and technology performance measures will be used to evaluate the program's success in achieving high priority needs, reducing costs, reducing risk, and deploying value added cleanup technologies. These areas are critical to achieving EM's accelerated geographic site cleanup goals within budgetary constraints. The "Environmental Management Research and Development Program Plan *Solution-Based Investments in Science and Technology*" published in November 1998, outlines the objectives for EM's corporate performance measures for Science and Technology as follows:

- Reduction in the cost of cleanup is described by the achievement of EM's accelerated cleanup goals. EM will review, on a site-by-site basis, by cleanup project, progress towards accelerated cleanup goals and what portion of that progress is attributable to specific investments made by EM in science and technology.
- Corporate performance measures for technology deployment will be retained as an output measure. However, EM will evaluate, by project, how many of these new technologies are provided as a result of EM's investments, and more importantly, what impact those technologies are having on cleanup projects.
- Investments against, and solutions to, high priority needs is a measure of the responsiveness of the investments to the cleanup project manager community and the ability to effectively manage EM science and technology investments. EM will measure both the numbers of high priority needs that we are trying to address and our success in meeting those needs.
- Reduction in technology risk will not only reduce cleanup costs, it will allow us to evaluate and track investments in areas where EM baselines have technology gaps or uncertainties. EM will evaluate on an annual basis how science and technology have served to lower technology risk levels. This evaluation will include both science and technology developed through EM's investments as well as externally developed science and technology brought to bear on EM's cleanup problems.

These corporate performance measures reflect EM's commitment to measuring the results of investments in science and technology. Some of the implementation details for these measures, particularly the ability to quantify the impact of technology investments on both "cost" and "programmatic risk" reduction are still being worked out. As with the program's other corporate performance measures, the measures for science and technology will continue to be refined and evolve as EM gains experience in using these measures to track and improve program effectiveness and efficiency.

In addition to these corporate level measures, EM has also implemented performance measures within the Office of Science and Technology that assess progress towards technology development: (1) number of alternative *technology systems demonstrated* that meet the performance-specification based needs as identified by the Site Technology Coordinating Groups; (2) number of alternative *technology systems ready for implementation* with cost and engineering performance data.

Science and Technology Performance Measures Challenges

The dynamic and complex nature of science and technology makes it difficult in some cases to: (1) accurately establish specific future technology performance goals and (2) quantify the impact of science and technology on program costs, schedule, and risks. In addition, there are communications challenges that arise as a result of the cross-complex coordination that must occur between the Focus Areas, Office of Science, Office of Technology, contractors, laboratories, site cleanup project managers, other EM Headquarters and Field managers, and stakeholders.

Examples of some of these challenges include:

1. Achieving sufficient EM "program" buy-in to the science and technology performance measures. Typically, science and technology performance measures have been viewed as being almost the sole purview of EM's Office of Science and Technology. These measures have generally not been fully integrated into the Headquarters and Field programs that are ultimately responsible for their implementation.

2. Demonstrating interim progress when final technology solutions may be years away. The complexity of some of the science and technology work scope makes it difficult to show interim progress in filling technology gaps and achieving long-term technological solutions to intractable problems. In addition, there appears to be somewhat of a reluctance to channel funds to science and technology when the payoff may not be realized for several years.

3. Showing the impact of science and technology investments on reduced program costs. Historically, cost savings within the EM program have been difficult to substantiate. The ability to reduce cleanup costs and to demonstrate that the reduction is a result of new technologies will likely be a challenge.

4. Establishing appropriate performance goals for science and technology. The nature of the science and technology work scope makes the prediction of specific accomplishments and outcomes difficult. As a result, performance goals may not always be

achieved within the targets anticipated (i.e., either as a result of over-predicting or under-predicting planned results).

5. Using programmatic risk data at a National level. This is a relatively new concept. Properly baselining programmatic risk scores is a critical initial step in this process. In addition, showing the relationship between the Focus Area work packages and ultimately the overall reduction in risk is key to evaluating the science and technology investment.

EM PERFORMANCE BASED MANAGEMENT CHALLENGES/LESSONS LEARNED

The Department's Strategic Management System implies a sequential process flow from planning, to budgeting, to execution, and to evaluation. In reality, there is turbulence involved in implementing a performance based approach to management in many agencies or organizations, including EM. The EM organization has faced a number of challenges in establishing performance-based accountability that have resulted in "lessons learned" for the program, including the following:

1. Align the measures with the key processes of planning, budgeting, execution, and evaluation. This helps to ensure that planning informs budgeting and provides for periodic program/project evaluation and feedback. An aligned system of measurement also results in consistent products, including strategic and annual plans, budgets, and evaluation reports. Initially, EM's measures were not well-aligned with strategic planning nor integrated with the budget process. Achieving alignment of key processes is difficult and may require several iterations.

2. Clarify the performance measures and their definitions to ensure a common understanding and consistent implementation. Initially, EM experienced recurring revisions to many of the program's measures and their definitions. These measures were not always commonly understood across the complex. In addition, there was a tendency to develop excessive numbers of measures. It is important to ensure that a core set of performance measures are established that assess key mission areas critical to the success of the program.

3. Cascade the performance measures to all organizational levels. This enables the measures to be aggregated to a summary/total level and disaggregated to determine root causes and problems. Initially, EM Headquarters collected performance measures data primarily at the Operations/Field Office level. Measures are now collected by EM project (PBS), and are subsequently rolled-up to the Site, Operations/Field Office, and total EM levels. These measures must be clearly communicated and understood by all employees and incorporated into managers' performance appraisals, as appropriate.

4. Establish baselines from which to assess progress and results. Baselines will set near-term performance expectations within a life-cycle context to focus on near-term results and progress towards ultimate program "outcomes". A change control process should be implemented to maintain the integrity of the baselines.

5. Improvements to data quality requires continuing commitment both at Headquarters and the Field. The quality of the performance data will improve as the data is used by EM Headquarters, the Field, and external parties to make decisions. It is a time-consuming and continuous process to develop accurate and complete performance measures data.

6. Assign clear organizational roles and responsibilities for performance management. Currently, "ownership" of EM's Corporate Measures is somewhat splintered among various EM organizations (i.e., program offices, such as Waste Management and Environmental Restoration; Site Lead Groups, such as Albuquerque, Chicago, Savannah River; related Budget staff; and planning groups). Specifically, there appears to be difficulty in establishing "ownership" for the technology deployment measure by the Site Leads -- this measure still appears to be viewed as the responsibility of the Office of Science and Technology. There appear to be similar organizational challenges in the Field.

7. Institutionalize performance management throughout the program. There has been an overall Headquarters/Field reluctance to being measured and holding managers accountable for results. At times, measures were viewed as simply an exercise to satisfy a Headquarters reporting requirement. There has also been a continuing reluctance to establish challenging performance goals that "stretch" the organization.

PATH FORWARD

Listed below are near-term next steps for improving EM's performance measures and their successful implementation throughout the organization:

- Review the existing corporate performance measures to determine if they still meet EM's needs or if additional/other measures or revisions are required to more fully assess both near-term and long-term program progress and results;
- Systematically analyze the performance data reported by EM's Operations/Field Offices. Determine the relationships between the performance measures results and the intended program "outcomes";
- Use the performance information to identify required improvements to program and project effectiveness and efficiency. Incorporate performance information into the planning and budgeting decision-making processes and use the information to make decisions;
- Establish an evaluation process for the measures as part of the Quarterly Management Reviews (QMR) and hold managers accountable for the results that are reported;
- Continue to improve the quality and completeness of EM's performance measures data, particularly life-cycle information;
- Clearly define organizational responsibilities for performance management to eliminate organizational "stovepipes" and barriers. Communicate these roles and responsibilities to the employees responsible for performing the work;

- It is an iterative process to develop, refine, and improve performance measures and implement a results-oriented approach to management.

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