

MEASURING PROGRESS IN THE DOE ENVIRONMENTAL RESTORATION PROGRAM

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ABSTRACT

Measuring program progress and performance is critical to ensuring that program goals are achieved. In addition, such measures can aid in the effective communication of progress to stakeholders, regulators, and oversight organizations. In this time of fiscal constraints, the DOE Environmental Restoration Program must improve upon its systems for tracking and reporting program outputs and outcomes. With the recent baselining of the Environmental Restoration Program, a structure within which progress can be tracked has been developed. This paper discusses some of the issues associated with the development of robust indicators for measuring progress in the Environmental Restoration Program. The paper focuses on framing the program, identifying appropriate measures, and data collection.

BACKGROUND

Progress and performance measures in a large public sector program are a useful tool for assessing progress toward a stated goal or objective. A recent U.S. General Accounting Office (GAO) report evaluated performance measurement activities within 102 Federal Agencies (1). The report concluded that performance measures are used by approximately two thirds of the organizations surveyed. However, GAO commented that relatively few agencies reported having the "organizational characteristics that would make it likely for them to use performance measures to assess progress toward goals in their [strategic] plans." The GAO report suggests, that as resources shrink, agencies will have to focus on achieving the results envisioned in their strategic plans. Indicators can provide managers with information about accountability, efficiency, and effectiveness, and they can provide Congress and the public with information on how resources are being used.

Performance measurement usually consist of regular collection and reporting of inputs, activity level, outputs, outcomes, and efficiency. In the recent book "Reinventing Government" (2), the authors, David Osborne and Ted Gaebler, suggest that current government agency measures often focus too much on inputs and activity levels and too little on outputs and more importantly outcomes, effectiveness and efficiency.

Another GAO report confirms this position; the GAO Transition Series included a report on program evaluation issues (3). Issues in that report include the need for better measures of program effectiveness and an emphasis on appropriate measurement of program successes (and failures). The GAO emphasized the need for federal officials to be informed about the implementation and results of federal investments and the importance of adequately informing the President, the Congress, and the nation about what has happened. It may not be long before performance measurement is required. A bill that passed in the Senate during the 2nd Session of the 102nd Congress (S.20) provided for the "establishment, testing, and evaluation of strategic planning and performance measurement in the Federal Government..." (4)

Measuring outputs, outcomes, effectiveness, and efficiency can be quite difficult in a large, complex program like DOE's Environmental Restoration Program. The measures have to be carefully selected and evaluated, else one runs the risk of selecting inappropriate or inadequate indicators. In

fact, historically there have been performance measures for federal programs that have "backfired" and motivated "perverse" policy decisions (2). Nonetheless, avoidance is not the solution to the potential risks involved with indicator development. Refinement and improvements to indicators should be considered a natural part of the process. As David Osborne points out, it can take several years to develop adequate measures, and often a program has to transition slowly from measuring inputs and activity levels to measuring outcomes and efficiency (2).

Progress measurement in environmental cleanup programs is not new. In the late 1980s, progress measurement plagued the Superfund Program. As a result, EPA developed Superfund Progress Indicators and has been aggressively pursuing the collection and reporting of progress ever since. The Superfund progress indicators were born of necessity. In 1989, Clean Sites published "Making Superfund Work -- Recommendations to Improve Program Implementation" (5). The report clearly identified the problems associated with EPA's focus on counting the number of sites delisted from the NPL. At that time, it was anticipated that delisting could take ten to fourteen years. It was clear that incremental progress needed to be tracked and reported to the public. The Superfund Program developed indicators in 1990 and several reports have been published since then (see as examples, 6,7,8). While the Superfund indicators are still evolving, they have dramatically improved EPA's ability to report on progress in the program. Some of EPA's measures are discussed later in this paper.

To date, the U.S. Department of Energy's Office of Environmental Restoration (EM-40) has relied on a variety of tools to collect and report progress. These tools include site-specific reports (e.g., Site-Specific Plans, newsletters, updates, etc.) and several complex-wide reports including the yearly Office of Environmental Restoration and Waste Management (EM) Five Year Plan and the quarterly EM Progress Newsletter. In an effort to improve progress and performance measurement, EM-40 has begun to investigate and experiment with a set of more robust, uniform, and measurable indicators. This initiative is motivated by the recognition of the need for such indicators, the precedent in EPA, and indications from GAO, OMB, and the White House that such measures will become a Federal Government priority.

Along with Site-Specific Plans, Five Year Plans, and other activities to report accomplishments mentioned above, EM and DOE have two other processes in place. The EM Progress Tracking System (PTS), which is being implemented, will collect "traditional" measures of progress including cost and schedule information. The PTS will be an invaluable tool for programmatic reporting of project management parameters as described in DOE Order 4700.1 and DOE Notice 4700.5.

In addition, Secretary of Energy Notice SEN-29-91 requires performance indicators and a trending program for DOE Operations. The indicators required by SEN-29-91 focus on personnel safety, operational incidents, environmental releases during normal operations, and management. The quarterly site reports being developed as a result of this Notice encompass all departmental elements. The Assistant Secretary for Nuclear Energy (NE) and the Office of Environment, Safety, and Health (EH) are collaborating in the collection and analysis of this data. The DOE Performance Indicators complement environmental restoration-specific indicators by evaluating health and safety issues which are a priority in EM.

Despite all of these activities, sound progress and performance measurement is lacking for the Environmental Restoration Program. Unique aspects of the Environmental Restoration Program's strategic goals and objectives require new and more comprehensive measures. And, a systematic approach must be developed to collect and analyze progress. This paper looks at ways to measure demonstrable progress toward achieving the overall goals of EM-40, which are to reduce human health risk, minimize environmental damage, and comply with all applicable laws, regulations, and agreements.

PROGRAM HISTORY

In November of 1989, EM was formed. Environmental activities, previously managed throughout other DOE offices, were consolidated under EM. EM-40 is one of several line organizations within EM. EM-40's mission is to clean up inactive and surplus facilities and to protect human health and the environment in accordance with applicable laws, regulations, and agreements. The activities associated with such a mission are formidable and diverse. To put perspective on the EM-40 program, consider the following facts:

- There are activities in 33 states and Puerto Rico.
- There are over 125 different environmental restoration installations, sites, or locations.
- There are many thousands of individual release sites and facilities that must be investigated, and if necessary, cleaned up.
- The combined area of the ten largest installations is greater than 3,000 square miles.
- There are 17 installations on the National Priorities List (NPL).
- The environmental restoration activities are regulated by numerous DOE Orders and federal, state, and local statutes.

Significant progress has been made over the last twenty years with respect to the management and implementation of DOE cleanup projects. By 1989, when EM-40 was formally established, most sites had initiated environmental restoration activities. These activities exemplified DOE's effort to

come into full compliance with environmental regulations. Numerous site-specific agreements were signed with regulators to ensure compliance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Resource Conservation and Recovery Act (RCRA), and other state, local, and federal statutes and regulations. Several of the cleanup programs that had been established prior to 1989 were consolidated into the Environmental Restoration Program. Those programs included: the Uranium Mill Tailings Remedial Action (UMTRA) Project, the Formerly Utilized Sites Remedial Action Project (FUSRAP), the Weldon Spring Site Remedial Action Project (WSSRAP), the Battelle Columbus Laboratories Decommissioning Project (BCLDP), and other activities conducted under the Surplus Facilities Management Program (SFMP). Since 1989, these established programs along with most other DOE environmental restoration and decontamination and decommissioning projects have fallen within the jurisdiction of EM-40.

Recently, EM-40 has baselined all the environmental restoration activities. The activities have been organized into a programmatic work breakdown structure (PWBS). The PWBS captures the entire scope of the program under 17 major system acquisitions/major projects (MSA/MP) in accordance with DOE Order 4700.1. Each MSA/MP is broken down into installations and then further subdivided into "sub-projects". All subprojects are categorized as either remedial action (RA), decontamination and decommissioning (D&D), landlord (LL), surveillance and maintenance (S&M), treatment/storage/disposal (TSD), or program management (PM) in accordance with Headquarters' definitions. The current PWBS contains 310 RA, 79 D&D, 76 PM, 9 TSD, 14 S&M, and 6 LL subprojects. The establishment of a program baseline presents itself as an opportune time for implementation of a progress/performance measuring system. The scope of the program can be analyzed within the context of the PWBS.

DEVELOPING INDICATORS: FRAMING THE SCOPE

Prior to the development of indicators, a clear understanding of the technical scope of the subprojects must be formulated. As an example, take the 310 remedial action subprojects. Through the history of the program, most progress reporting has focused on the classic cleanup activities associated with release sites, operable units, closures, sites and/or installations. While cleanup projects may constitute the majority of RA projects, there are other activities that are equally important. The key to developing good indicators is to group activities without oversimplifying the technical scope of the program. Most remedial action activities fit one of the following groups:

- Operable Unit Equivalents (OUEs) and closures;
- Site-wide activities;
- UMTRA/FUSRAP sites and/or vicinity properties (VPs); and
- DOE contribution locations.

Operable Unit Equivalents (OUEs)/Closures

Each OUE follows a general schedule that includes a preliminary scoping phase, an assessment phase, a remediation phase, and a follow-up operation and maintenance (O&M) phase. An OUE is considered to be a completed

project at the end of the remediation phase or when a determination that no further remedial action is necessary. In general, the assessment and remediation phases of these projects are separated by a record of decision (ROD) or a similar decision document that identifies the remedy selected for that project. In addition, some OUEs are also addressed through interim removal actions or expedited response actions, which generally occur during the assessment phase of the project.

Closures are common in the environmental restoration program and at least 10 or 15 closures have been completed in the last two years. Other closures are currently in progress. RCRA closures follow a schedule similar to OUEs; that is, they have an assessment phase culminating in a closure plan that identifies the appropriate closure requirements. Post closure monitoring is generally conducted after completion of a RCRA closure.

There are over 500 OUEs or closures in progress or planned. The OUEs address contamination caused by thousands of individual release sites. These cleanup projects have been aggregated at some sites into larger groupings for reporting, assessment, and planning purposes.

Site-Wide Activities

Site-wide activities is a grouping that serves as a catch-all for a wide variety of activities that don't fit the classic OUE or closure definition. Site-wide activities include document preparation (e.g., site-wide NEPA documents), site-wide assessment activities (e.g., site-wide scoping and/or surveillance, PA/SI programs, etc.), groundwater characterization and monitoring projects, storage tank removal/replacement programs, site water management projects, waste management, and other activities. It is common for installations to be conducting one or more of these site-wide activities. There are currently approximately twenty RA subprojects that are best described as site-wide activities. They often require unique indicators to fairly evaluate their performance.

FUSRAP/UMTRA

FUSRAP addresses contamination from sites and facilities associated with the Manhattan Engineer District and the Atomic Energy Commission, both of which are DOE predecessor organizations. DOE is responsible for the cleanup of at least thirty-three FUSRAP sites. FUSRAP projects include vicinity properties, interim storage sites, and other types of facilities. DOE has made significant progress at FUSRAP sites; ten sites have been completed and the majority of the remaining 23 are in the latter stages of assessment or cleanup. Eventually, all of the contaminated material to be addressed will be disposed of in permitted disposal facilities.

UMTRA addresses uranium ore that was mined in the U.S. in the 1960s for the Atomic Energy Commission. The tailings present a potential long-term health hazard because they emit small amounts of radon gas and contain other radioactive and nonradioactive contaminants that can pollute groundwater. The UMTRA Program was created to remediate these dangers. UMTRA is addressing 24 uranium processing sites and more than 5,000 vicinity properties (residences, businesses, and open lands where the tailings were used as fill dirt or otherwise contaminated the area). The remedial actions consist of stabilizing the tailings piles or, in some cases, relocating the piles to more remote locations. The piles are then capped to prevent radon release, control erosion, and

minimize the infiltration of groundwater that could cause contaminants to leach from the pile into the groundwater. After cleanup or stabilization, the sites are monitored and maintained. DOE is establishing a monitoring program to determine the extent of the groundwater contamination and develop a feasible remediation plan near these old mill tailing sites.

DOE Contribution Locations

In some cases, DOE is not the lead agency in a cleanup effort. There are several sites where DOE is simply one of several responsible parties that are pooling financial resources to clean up a site. These projects have been identified and will be tracked separately from other RA subprojects.

SELECTING INDICATORS

Indicators for the EM-40 program must cover a number of diverse activities like the ones mentioned above. In addition, D&D, S&M, LL, PM, and TSD subprojects must be similarly analyzed. For remedial action subprojects, they must consider the varying stages of assessment and cleanup, the lack of extensive site-specific characterization data for some sites, and the poor level of risk data available for many projects. The indicators should be consistent with specific objectives within the Office of Environmental Restoration's Strategic Plan and should contribute to evaluation of program effectiveness and overall performance. The indicators discussed here:

- can be linked to strategic planning and performance measurement;
- allow for the measurement of incremental progress toward EM-40's long-term goal;
- complement PTS reports and DOE's Performance Indicators;
- support yearly reports on progress for both internal analysis and external communication; and
- cover the broad spectrum of project types.

It has been argued that in a program that is almost exclusively driven by regulations and legal agreements, progress should be measured solely by one's ability to meet mandated milestones while maintaining health and safety standards. Indeed, while compliance with various statutory milestones (e.g., completion of Workplans, RI/FSs, Record of Decisions [RODs], etc.) is a good start, it simply rewards the beginning of each new phase of the process. Measuring milestones leaves the question of quality, timeliness, effectiveness, efficiency and outcome unanswered. Therefore, the measures must go beyond milestones.

Program outputs are only a starting point for progress measurement. Outcomes (e.g., risk reduction, public acceptance, uncertainty reduction) must be the next objective of indicators. Ultimately, effectiveness and efficiency must be evaluated. For remedial actions, the indicators should focus on the actual physical site remediation that protects human health and the environment. For assessment activities, the indicators should focus on the quality of the data collected, and its usefulness in selecting appropriate remedial strategies. For treatment, storage, and disposal activities, the measures should focus on developing the right amount of capacity, the long-term effectiveness of the facilities, and the timeliness of their availability. For program management activities, public

acceptance, management systems, and oversight effectiveness should be measured. The goal is to have a robust set of measures that can satisfy many purposes. They should appeal to and be understood by many diverse stakeholder groups; they should be useful to management; and they should allow for effective communication to oversight organizations and agencies (e.g., Congress, OMB, etc.)

The following indicator areas are a subset of the preliminary set that have been selected for analysis with respect to the DOE Environmental Restoration Program. While all the indicators cannot be individually described here, each has been selected after careful analysis of the technical scope of the EM-40 program. All activities and progress measures are being maintained in a format consistent with the PWBS. While many of these indicators would be considered "output" indicators, they serve as a sound foundation for movement toward "outcome" and "performance" measures.

Installation Level

Public Participation/Awareness Activities
Miscellaneous Past Progress

Subproject Level

Program Management Accomplishments
Environmental Restoration Treatment/Storage/Disposal Accomplishments
Site-Wide Activity Accomplishments
DOE Contributions

Landlord Functional Accomplishments

Operable Unit Equivalent/D&D Project Level

Phase - i.e. pre-assessment, assessment, remediation, complete

Assessment Progress

Decision Documents Developed and Approved

Physical Amounts of Material Addressed

Short-Term Risk Reductions

- providing alternative water supplies
- evacuating/relocating people
- providing additional security
- treating, containing, stabilizing, or removing contaminated material

Risk Status - exposure likelihood, risks posed, risks eliminated

Technologies Employed

Release Site/Individual D&D Facility Level
Phase

No Further Remedial Action Determinations

Completed Actions

CONCLUSION

The development and utilization of indicators is critical to EM-40's achievement of its overall mission and to its communication of progress. The indicators will provide an invaluable aid in EM-40's strategic planning process and will highlight progress that might otherwise go unnoticed by the public and other external organizations. Indicators, in combination with DOE's Progress Tracking System, will result in a comprehensive progress reporting system. The preliminary data suggests that DOE has made progress in all of the areas listed above. Ongoing data collection and aggregation in the near future will improve upon the preliminary results. The indicators will evolve with time until an effective indicators program is in place.

REFERENCES

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