# Top-to-Bottom Review of

# Environmental Management Program:

# Status of Implementation

**Report to Congress**

**October 2003**

# Preface

This report was prepared in response to section 3176 of the Bob Stump National Defense Authorization Act for Fiscal Year 2003, which directs the Secretary of Energy to document progress made in addressing issues and actions identified in *A Review of the Environmental Management Program*—a report to the Assistant Secretary for Environmental Management (EM), U.S. Department of Energy (DOE), by the Top-to-Bottom Review Team. This report covers the progress made in the EM program through September 2003 and consists of three main sections:

- Section I describes EM's strategy for accelerated risk reduction and closure at DOE sites for which cleanup has not been completed.
- Section II provides a report summary addressing each of the areas of discussion identified by section 3176. In each area, past accomplishments, current activities, and future plans are summarized.
- Section III presents a detailed discussion in each of the areas summarized in Section II.

The report ends with a glossary of acronyms used in the text and on the accompanying figures and tables.

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# I. EM's Accelerated Risk Reduction and Site Closure Strategy

## 1. A National Program of Vast Scope

The Environmental Management (EM) program was created in 1989 to address the environmental legacy of the nation's Cold War nuclear production. The program encompasses a wide range of wastes and materials at sites scattered throughout the nation. It includes the remediation and processing of approximately:

- 25 tons of plutonium
- 108 tons of plutonium residues
- 88 million gallons of radioactive liquid waste
- 2,500 tons of spent nuclear fuel
- 137,000 cubic meters of transuranic waste
- 1.3 million cubic meters of low-level waste
- 324 nuclear facilities, 3,300 industrial facilities, and hundreds of radiological facilities

## 2. Uncontrolled Cost and Schedule Growth

As noted, the EM program was created to remedy the legacy of the Cold War's impact on the environment—not simply to manage the waste. Over the past 10 years, the program has experienced difficulty in planning and carrying out this mission. As a result, in just 4 years the life-cycle cost of the program increased from $147 billion to $225 billion, and if EM were to continue business as usual, the cost could easily increase to $300 billion. During that same time period, moreover, schedule slippages occurred yearly.

## 3. Lost Focus on Core Mission: Risk Reduction

The Top-to-Bottom Review Team reached the following main conclusions:

- EM had lost its focus on risk reduction.
- The regulatory framework governing the cleanup program—in many cases negotiated with EM—had failed to prioritize or promote cleanup and risk reduction.
- EM's contracting strategy had failed to deliver cleanup and risk reduction, awarding large fees to contractors for very little in the way of tangible results.
- EM had failed to reduce environmental and public risks. For example, spent nuclear fuel was still being stored in old wet storage basins less than a quarter of a mile from the Columbia River. The inventory of radioactive liquid waste had continued to grow through the 1990s despite a halt in the production mission. And weapons-grade nuclear material remained scattered around the country at several sites, despite having no future uses at those sites.
- The costs of the program had continued to escalate. Through 2000, $70 billion had been invested in the EM program, yet the cost and schedule for completing the program had increased yearly. In fiscal year 2000 (FY00), when more than $6 billion was spent on the program, the estimated cost to complete the program grew by more than $14 billion. Over one-third of the sites extended their closure date by at least a year in FY00 alone. Indeed, the estimated cost to complete this program was staggering. Cleanup of DOE's environmental legacy was one of the largest federal liabilities in the U.S. Government's financial statement.
- The public had grown disenchanted; the environmental regulators had grown impatient; and the taxpayers had grown wary.

## 4. Status Quo Unacceptable: Fundamental Change Required

As noted, except for the national debt and federal and military pension benefits, EM is one of the largest U.S. Government liabilities, estimated at $225 billion. The Review Team concluded that, unless a massive restructuring of the program was completed, DOE would be unable to complete its cleanup mission, and the risks and cost of the EM program would continue to increase. Immediate and aggressive actions were thus required.

## 5. One Clear Goal: Accelerated Risk Reduction

The EM program has one clear goal: accelerate risk reduction and cleanup while protecting the health and safety of workers and the public and protecting the environment—on time and under budget.

Our expectations are clear and measurable. We will stabilize high-risk materials such as radioactive waste stored in tanks, spent nuclear fuel, enriched uranium and plutonium, and some transuranic waste. We will clean up, shut down, and demolish high-risk facilities. We will clean up and close down sites. And we will reduce risk to public health and the environment and respect the taxpayers' money.

## 6. The Building Blocks for Mission Success

### Contracting for Success

EM has revamped its contracting strategy to drive accelerated closure, and is reviewing all contracts and negotiating modifications of those that do not support closure. Many contracts are being reevaluated or renegotiated to shorten schedules, establish more focused performance incentives, and restructure projects to accelerate risk reduction. One example of this initiative is the December 2002 contract award for the cleanup and closure of the Mound site. Just 12 months ago, the closure date for this site had slipped to 2010; under the current contract, cleanup is to be completed by the end of FY06.

### Site-Specific Closure Initiatives

EM has developed Performance Management Plans (PMPs) with sites to identify specific initiatives and deadlines for accelerating risk reduction and to ensure accountability for progress toward closure. From these plans, EM has developed new corporate performance measures, presented in the appendix to this report, which will clearly measure the progress in risk reduction made by each of the sites. This information is summarized in Table 1. EM will hold itself accountable for delivering this performance. These initiatives reduced the projected overall life-cycle cost of the EM program for FY02 by over $30 billion relative to the FY01 estimate and will reduce the time to complete cleanup by 35 years.

Budget and costs are directly related to the PMPs through performance-based incentives. With this system in place, contractors are both rewarded for good performance and held accountable for poor performance. Performance is measurable, not subjective, and is clear and visible to Congress, regulatory agencies, and the public.

**Table 1. EM's Short-Term Performance Goals**

| Performance Measure | Unit | Targets | | | Completed to Date (Pre-2003 Actuals) | Life-Cycle Scope |
|---|---|---|---|---|---|---|
| | | FY03 | FY04 | FY05 | | |
| Pu packaged for long-term disposition | containers | 2,836 | 1,323 | 165 | 1,484 | 5,850 |
| eU packaged for disposition | containers | 277 | 925 | 669 | 1,853 | 9,101 |
| Pu/U residues packaged for disposition | kg bulk | 934 | 254 | 76 | 106,519 | 107,782 |
| DU & U packaged for disposition | MT | 1,815 | | | 3,100 | 742,149 |
| Liquid waste eliminated | k-gallons | 700 | 1,300 | 1,900 | | 88,000 |
| Liquid waste tanks closed | tanks | 1 | 9 | 9 | 2 | 241 |
| HLW packaged for disposition | containers | 130 | 250 | 250 | 1,612 | 18,735 |
| SNF packaged for disposition | MTHM | 857 | 633 | 0.873 | 639 | 2,420 |
| TRU disposed | $m^3$ | 4,522 | 12,952 | 13,678 | 7,720 | 141,314 |
| LLW/LLMW disposed | $m^3$ | 75,030 | 89,815 | 107,067 | 284,206 | 1,155,360 |
| MAAs eliminated | areas | | 1 | 1 | 6 | 14 |
| Nuclear facility completions | facilities | 2 | 5 | 14 | 17 | 523 |
| Radioactive facility completions | facilities | 7 | 45 | 67 | 124 | 804 |
| Industrial facility completions | facilities | 49 | 110 | 187 | 510 | 2,423 |
| Geographic sites eliminated | sites | 2 | | 2 | 75 | 114 |
| Remediation complete | sites | 214 | 200 | 283 | 4,928 | 10,374 |

**Regulatory Reform**

EM is working with regulators to review and revise regulatory agreements and approaches to regulatory compliance at all cleanup sites. We are scrutinizing compliance agreements and DOE's approach to compliance to ensure that they are consistent with accelerated risk reduction. EM has received letters of endorsement from federal or state regulators in 12 states, and has reached agreements in Tennessee and Colorado on revised regulatory approaches. State and federal regulators have also helped DOE develop individual site PMPs. DOE has made this shift to accelerated risk reduction within the existing regulatory framework. This initiative has already led to a significant increase in emphasis on risk reduction.

## 7. Delivering on Our Commitment—Results from 2002

In less than 24 months, EM's new strategy has already resulted in significant gains in cleanup and risk reduction:

- At Richland, the greatest risk reduction will be the removal of spent nuclear fuel from the potentially leaky K-Basins, less than a quarter of a mile from the Columbia River. In the last year, the site has accelerated removal of fuel for packaging into dry canisters to a rate of six multi-canister overpacks per week. More than 1,400 tons of uranium and plutonium has been safely removed and stored.

- Shipments of transuranic waste to the Waste Isolation Pilot Plant (WIPP) have more than doubled to greater than 30 per week. Since February 2002, WIPP has received approximately 10,000 cubic meters of transuranic waste that is now safely and permanently disposed deep underground.

- DOE has opened a new low-level waste disposal cell at Oak Ridge.

- Rocky Flats met the FY02 requirement for packaging 984 containers of plutonium that are double contained and suitable for long-term (up to 50 years) storage. Through September 2003, the actual number is 1,895. The site has removed all weapons-usable nuclear materials and is on track for closure by 2006.

## 8. Staying the Course: The Short Run

The next two fiscal years will be critical for the future of EM's new approach to risk reduction. The success achieved thus far, while significant, is modest compared with what we can achieve with continuing commitment and support over the coming years.

## 9. Staying the Course: The Long Run

The most important benefits of the new strategy will be realized in the long run. If we are successful:

- The cleanup mission will have been completed 35 years ahead of the previous plan.

- Risks to workers, communities, and the environment will have been eliminated a generation earlier than under the old plan.

- The burden on taxpayers will have been reduced by more than $50 billion.

The EM program is charged with cleaning up sites that pose some of the most dangerous public health risks in America. After spending a decade of time and tens of billions of dollars for meager results, the program is now engaged in an aggressive effort to reform its cleanup

approach to deliver more risk reduction on a faster schedule while respecting finite taxpayer resources. The new approach has already provided more real cleanup to communities throughout the country, and will reduce projected schedules and budgets for the overall program. As shown in Table 1, our performance goals for the near term are clearly defined, measurable, and aggressive. FY04 is critical to EM's long-term success. Continued support for the necessary reforms is essential to guarantee the program's success and to make its new approach to cleanup irreversible.

# II. Report Summary

On February 4, 2002, the Secretary of Energy accepted the recommendations of the Top-to-Bottom Review Team and directed the Assistant Secretary for Environmental Management (EM) to act on those recommendations. Subsequently Congress, in section 3176 of the Bob Stump National Defense Authorization Act for Fiscal Year 2003, directed the Secretary of Energy to prepare a report on the status of EM initiatives in response to the Review Team's recommendations and listed specific topics to be covered in the report. This report was prepared to meet those requirements.

When the Assistant Secretary submitted the Top-to-Bottom Review Team's report to the Secretary, she stated in part: "The changes that I envision are not changes in the margin or around the edge; rather it requires a complete retooling and overhaul. The attached report provides the framework for our pathway forward. We will use a risk-based approach to cleanup that is mindful of resources, respectful of our environment, and responsive to the taxpayers and our neighbors alike. More will need to be done as we implement. I propose to move forward expeditiously to develop the key elements of our implementation strategy. I will provide you routine updates as we deliver more real cleanup."

Significant progress was demonstrated by the end of fiscal year 2003 (FY03). Major accomplishments have already been made, as discussed in detail in this report. In summary, letters of intent endorsing accelerated cleanup have been signed by 12 states and DOE; 18 sites have written new Performance Management Plans (PMPs) focused on accelerated risk reduction; and the continual life-cycle cost increases and schedule slippages that previously characterized the program (see Section I) have been halted. The sites' PMPs decrease overall life-cycle costs by over $30 billion, and the time to complete the program has been reduced by 35 years.

More important for the implementation of EM's new cleanup strategy has been the creation of Integrated Project Teams (IPTs) for 10 key initiatives identified in the Top-to-Bottom report. These teams, comprising top-performing federal employees, are described in more detail in Section III. Whereas the PMPs are being developed for individual sites, the IPTs will be formulating corporate-level initiatives to accelerate risk reduction in a much-improved, more cost-effective manner.

Selected examples of progress in each of the areas required to be covered in this report are described below. A more detailed discussion is contained in Section III.

# 1. Reduction of Environmental Risks and Challenges That Are Faced as a Result of the Legacy of the Cold War

## 1.A Acquisition Strategy and Contract Management

**Past.** A key finding of the Top-to-Bottom Review Team was that the manner in which EM developed, selected, and managed many contracts was not focused on accelerating risk reduction and applying innovative approaches to the cleanup work. DOE's contracting strategies and practices made poor use of performance-based contracts to carry out EM's cleanup mission. Processes for contract acquisition, establishment of performance goals, funding allocation, and government oversight were managed as separate, informally related activities rather than as an integrated corporate business process. The result was performance standards that were applied inconsistently and ineffectively.

**Current.** EM is using contracts to drive outstanding performance and is paying for performance. One example of progress in this area is the December 2002 award of a new contract for the cleanup and closure of the Mound site. The Request for Proposals (RFP), issued in July 2002, included a detailed scope of work that allowed contractors to understand the work in sufficient detail to make realistic bids. Details of government-funded services and items (GFSI), including required DOE oversight, are provided, and performance-based incentive (PBI) fees will be negotiated as part of the contract. This whole process, which required changes in DOE's internal business practices, was accomplished in just 6 months. As for contract management, many contracts are currently being renegotiated to reduce schedules; establish new, more aggressive PBIs; and re-baseline projects. PMPs have been established at 18 sites to accelerate risk reduction. These baselines become the floor expectations for the accelerated risk reduction program. A contract management review board has been established, and PBIs and other key project parameters have been placed under strict configuration control.

**Future.** The acquisition strategy being put in place is designed to be results oriented. The goal is to safely complete cleanup and disposal by 2035. Progress will be measurable in a number of ways, but specifically by an actual reduction in source terms as indicated by corporate performance measures (see the appendix). Contracts will be extended and modified, as appropriate, when excellent performance is demonstrated; contracts will be recompeted when better performance is required. The use of small businesses is an important part of this strategy and is expected to drive innovation and cost performance. Also, at sites where both cleanup efforts and programmatic missions are being performed, EM will unbundle the cleanup work from ongoing missions and select contractors with the special skills needed for cleanup work, while the Office of Nuclear Energy, Science and Technology, the Office of Science, and the National Nuclear Security Administration will continue to select contractors with the necessary skills to carry out their missions.

## 1.B Regulatory Agreements

**Past.** More than 10 years ago, when the states, DOE, and the Environmental Protection Agency (EPA) entered into agreements to clean up and close many DOE sites, the intent was to set targets for future cleanup actions with the understanding that preliminary work was needed to characterize the extent of contamination. Based on that information, potential cleanup options would be reviewed. In some cases, agreements were developed with detailed milestones and records of decision that prejudged characterization results and focused on near-term milestones instead of addressing the highest risks. As a result, meeting these milestones diverted resources from achieving long-term goals, and in a few cases actually increased risks to the public and workers. There are also examples of agreements requiring end points that cannot be measured, do not reduce risk to the public, and significantly increase risk to workers.

In some cases, more-effective solutions to risk reduction have not been pursued because of DOE's unwillingness to reopen records of decision. In some cases, DOE has simply accepted or even advocated local positions without considering the national interest. Implementation of cost-effective methods is often delayed because of the tendency to assume that less costly means less effective. As a result, improved technology is not being fully utilized, realistic end states are not being established, and intended future uses of contaminated areas have not been agreed upon at some sites.

The Top-to-Bottom Review Team observed that another factor leading to delays and increased costs was related to use of the Resource Conservation and Recovery Act (RCRA) instead of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) for closure. In general, CERCLA has a prescribed process that includes public participation and the development of a project plan with a negotiated end point for cleanup. The CERCLA process encourages site-wide planning with consideration of cost and feasibility. The CERCLA process also incorporates similar evaluations required by the National Environmental Policy Act (NEPA).

**Current.** In addition to letters of intent signed by DOE, federal regulators, and applicable state regulators, the states and EPA have been given the opportunity to review and comment on individual site PMPs. DOE has to date been successful in working within the framework of existing regulatory agreements. In general, where relief has been needed, it has concerned interim milestones, sequencing of milestones, or state equity issues.

**Future.** As new cleanup strategies are developed to reduce risk more rapidly and more cost-effectively, DOE will continue to work with regulators so that regulatory agreements can be revised to incorporate these new, more-effective approaches. The new approaches will require shipment of various wastes from several locations to hubs for treatment and/or repackaging, and in some cases, for permanent disposal in approved disposal cells at those locations. Since these plans will involve state equity issues, DOE will work closely with the Western Governors Association (WGA) and the National Governors Association (NGA) to keep the governors fully informed and will strive to gain their support. To remain informed, the NGA has already convened a committee to work with EM and its IPTs.

## 1.C Interim Storage and Final Disposal of High-Level Waste, Spent Nuclear Fuel, Transuranic Waste, and Low-Level Waste and Low-Level Mixed Waste

**Past.** In many cases, wastes were being managed in a costly manner that was not in proportion to the risk posed to human health and the environment. The EM program included many instances of wastes being managed more stringently and at higher cost than was warranted by the health risks posed. Selected examples follow:

- Low-activity waste in the tanks was being managed as if high-cost retrieval and vitrification were the only option available to protect the public. This waste is less hazardous than some low-level waste (LLW) that was considered acceptable for lower-cost near-surface disposal. This problem arose because a single solution was sought for all tank liquids, regardless of their constituents/concentrations. This single solution was to treat all tank liquids in a conservative manner and manage them as high-level waste (HLW) regardless of their content. Furthermore, the conservative interpretation of cesium-137 as a "key radionuclide" under DOE Order 435.1 prevented consideration of viable low-risk, low-cost alternatives to the disposition of some waste containing that radionuclide. These requirements and assumptions resulted in retrieval and vitrification of low-hazard waste for negligible public health and environmental benefit. The Review Team pointed out that decisions based instead on technical risk evaluation would permit alternative treatment for some wastes. These actions would enable faster cleanup and substantial risk reduction at an accelerated rate.

- Shipments of transuranic (TRU) waste were often delayed because of size or weight limitations. Other limitations included the presence of organics, headspace gas measurements, and a very expensive certification process (up to $20,000 per 55-gallon drum). The Review Team noted that substantially less costly methods could be employed to manage TRU waste while protecting the public, workers, and the environment.

- There was no de minimis class of waste. Large quantities of waste containing small amounts of radionuclides and hazardous chemicals that posed negligible risk to public health and the environment were being managed at considerable cost as if they were highly hazardous. This was because the waste could not be shown conclusively to contain no hazardous substances. The Review Team suggested that basing release of these materials on technical risk evaluation could allow reuse or disposal in less costly facilities. Under the existing requirements, these wastes were classified as LLW or low-level mixed waste (LLMW).

- Some LLMW was being disposed of at greater cost than warranted by risk as determined by performance assessment (e.g., gloveboxes from the Rocky Flats Environmental Technology Site) or had no disposition pathway. The Review Team observed that providing disposal pathways for all such wastes would reduce risks and costs and accelerate site closures.

A major reason the EM program included many cleanup activities that were not aligned with the risk posed by the material involved was that many radioactive and hazardous chemical wastes were being managed based on their source, rather than assessment of risks to human health arising from waste management or disposal. As a result, wastes from different sources were being managed differently even when they posed similar health risks.

**Current.** IPTs have been selected and have progressed to the approval of Critical Decision 1 (CD-1), Approval of Mission Need and Project Initiation. The efforts of these teams have resulted in approved conceptual designs that form an integrated corporate approach to safe interim storage and final disposition of all these waste forms. The new plan that has been implemented at Savannah River will lead to the removal of 150 million curies and the closure of 20 HLW tanks by 2006. No tanks were planned to be closed at Hanford before 2006; now, plans are being made to empty up to 40 tanks by 2006. At Richland, the greatest risk reduction will be achieved through the removal of spent nuclear fuel (SNF) from the K-Basins. As noted previously, these basins are close to the Columbia River, and they contain failed fuel and have the potential to leak. Since the report of the Top-to-Bottom Review Team was issued, the contractor has accelerated the removal of fuel and its packaging into dry canisters from a rate of two to six multi-canister overpacks per week. More than 1,400 metric tons of heavy metal (MTHM) of uranium and plutonium has been safely removed and stored.

Shipments of TRU waste to the Waste Isolation Pilot Plant (WIPP) have increased to more than 30 per week. Since the February 2002 release of the Top-to-Bottom Review Team's report, WIPP has received 10,000 cubic meters of TRU waste that is now safely and permanently disposed deep underground. New LLW shallow-ground burial cells have been opened at Oak Ridge and Richland. Disposal of LLW and 11.e(2) byproduct waste has been accelerated both on site and at Envirocare in Utah and the Nevada Test Site.

**Future.** Risk reduction will be accomplished by stabilizing high-risk materials, by decommissioning and decontaminating high-risk facilities, and by accelerating disposal of TRU waste currently stored at interim sites around the country. This program will require a pragmatic approach to cleanup based on real risk reduction. The major cost driver in the EM complex is related to plans to retrieve, treat, and vitrify waste in the tank farms. Wastes are now being classified according to total curie content and the curie content of long-lived isotopes, and will be treated accordingly. Only those wastes with high-curie, long-lived isotopes are planned to be vitrified. Alternative processes, such as steam reforming, calcination, saltstone, or other grouting techniques, will be considered for stabilizing low-activity and TRU tank wastes. The effort to remove SNF from the Hanford K-Basins and the subsequent removal of water and sludge from the basins will be accelerated and will significantly reduce risk at the site. Other SNF is currently stored safely, but movement to dry storage and preparation for disposal at the national repository will be accelerated. Shipments of TRU waste to WIPP will be accelerated, and characterization will be improved to reduce the time and cost required. Also, improvement of the process will ensure that only those wastes that are clearly TRU and not LLW will be shipped to WIPP. Both WIPP and the national repository are valuable national assets, and an effort will be made to see that only those materials that need to be disposed in those facilities are shipped to them.

## 1.D Closure and Transfer of Environmental Remediation Sites

**Past.** EM's site closure program was large, complex, and expected to cost hundreds of billions of dollars and last many decades. The program had not been well integrated, but rather managed as a loose association of individual field sites. As a result, there was costly duplication of effort, and end-state criteria were not standardized. The program was often driven by defining specific forms of treated waste, particularly for high-level liquid waste, without establishing technical criteria for determining when such forms were needed and without evaluating the performance of alternative forms.

Cleanup of the sites was often further complicated by a lack of realistic future land-use assumptions, and by scenarios assuming that highly contaminated areas would be subject to farming, drilling of wells, or residential use. In contrast, the cleanup of commercial industrial sites assumed continued industrial use. "Brownfield" cleanups were being pursued to support faster cleanups and the productive reuse of property. Another major factor affecting DOE cleanups was points of compliance for groundwater contamination. To the extent that the points of expected compliance with state and EPA standards were located near areas unlikely ever to be released for public use, unrealistic goals for cleanup were established.

A number of issues, such as definition of HLW, revision of DOE Order 435.1, certification of shipping containers, and modification of waste acceptance criteria for repositories needed to be resolved at the national level. The Review Team noted that resolution of many of these issues could be accomplished without significant expenditure of funds. It would be necessary, however, to use the best talent to establish acceptable criteria that would ensure safe cleanup and disposal of waste at an accelerated rate.

The business of EM is safe cleanup and closure. The overriding goal is to reduce risk and protect public health and safety. The Review Team suggested that to accomplish that goal, priorities and the associated funding needs should be established at headquarters after consultation with the sites, and should be based on the process of risk reduction, not merely controlling risk. When establishing priorities, emphasis should be placed first on the highest risks to human health and safety. As an example, in most cases the highest priority would be placed on removing liquids and solidifying wastes from tanks or basins of questionable integrity.

The Review Team suggested further that the approach to closure should depend on the type of site being closed. All near-term closure sites (those with no future mission) should be given priority in accelerating cleanup to a predetermined end state and in accordance with long-term monitoring provisions. Thus DOE and regulators needed to agree upon a risk reduction program to protect public health and safety and a monitoring program that would ensure the continuation of that protection. The Review Team indicated that at long-term closure sites with massive or complex requirements, closure should be pursued in an orderly, efficient manner based on an integrated national program. Sites with a long-term mission should move to (1) reduce or eliminate new waste streams, (2) stabilize materials, (3) decontaminate and decommission high-risk facilities with no mission, and (4) reduce the site's footprint and "mortgage" costs associate with security and maintenance.

**Current.** There are 3 major closure sites (Rocky Flats, Fernald, and Mound) and 36 other sites for which cleanup remains to be completed. A detailed discussion is given in Section III, but schedules for Rocky Flats, Fernald, and Mound have all been accelerated to complete closure by 2006. In addition, incentives are now in place to achieve closure earlier. Except for groundwater monitoring, all work has been completed at Weldon Spring, and a closure plan is in place there.

**Future.** PMPs have been written to achieve cleanup and closure at EM closure sites by 2035 or earlier. In addition, at those sites that require major cleanup efforts but also have ongoing and long-term DOE missions, the plans require EM to complete the cleanup and return the land and/or facilities to the lead program office for future use or transfer to other entities. An important factor in meeting this goal will be reaching agreement with the regulators on end-state criteria and requirements for long-term monitoring. At some sites with ongoing missions, only interim actions may be achievable.

### 1.E Achievements in Innovation by Contractors of the Department with Respect to Accelerated Risk Reduction and Cleanup

**Past.** DOE's internal business processes did not give contractors incentives to take innovative approaches to reducing risks. In fact, most contractors earned the majority of their fees by simply managing the waste safely, and PBIs were not directed toward encouraging them to reduce risks. Performance standards were applied inconsistently and ineffectively. About two-thirds of the EM budget was being spent on fixed maintenance costs and other activities, and only one-third was being spent on actual cleanup and cost reduction.

**Current.** Contractors have been challenged and are proposing major changes to achieve accelerated risk reduction and cleanup. Neither DOE nor its contractors can achieve these changes by conducting business as usual. A number of examples of specific actions resulting in accelerated risk reduction, cost reduction, improved worker safety, and reduced schedules are cited in Section III. One such example is the process used at Rocky Flats for removing gloveboxes and shipping them for disposal. It was initially thought necessary to size reduce the gloveboxes, remove lead shielding, and dispose of the contaminated pieces as TRU waste. The contractor developed a process for decontaminating the boxes such that they became LLW and could be shipped intact to LLW disposal cells. As a result, worker safety was improved, and costs and schedules were reduced.

Although such individual examples are commendable, EM is taking a systemic approach to establishing PBIs, determining priorities for risk reduction, modifying contracts as necessary, and encouraging innovative project planning and delivery. An IPT has been formed to focus EM program resources on the cleanup project. A CD-1 has been approved, and in September 2003, the team completed its review of all EM activities in the field and headquarters. The team's report will include recommendations for activities to be eliminated or transferred to other organizations.

**Future.** The systematic strategy being used by EM will result in a program in which more resources will be focused on cleanup and closure, and contractors will have incentives to take innovative approaches. To achieve this goal, EM will insist on the uncompromising pursuit of top-quality performance, the creation of a closure mentality, and the application of innovative technology.

### 1.F Consolidation of Special Nuclear Material and Improvements in Safeguards and Security

**Past.** Nuclear material at EM sites was being kept in areas that were not optimum for efficient, safe, and secure storage. For example, SNM was being stored at the Savannah River Site, the Rocky Flats Environmental Technology Site, the Hanford Site, and Idaho National Engineering and Environmental Laboratory. Each of these sites therefore required expensive infrastructure to maintain appropriate safe and secure storage of these materials. At Hanford, for example, the cost to store plutonium safely was more than $40 million per year. This scattered storage configuration diverted EM cleanup dollars because of the high annual fixed costs involved (more than $200 million per year) in maintaining this infrastructure, productivity losses in the cleanup program, and the need to react to safety and security requirements.

DOE had taken several steps to consolidate its nuclear materials, supported by environmental impact statements. However, actions to implement these decisions had been hampered by a lack of certified shipping containers, as well as the overall low priority placed on such actions by DOE.

In addition to SNM, thousands of TRU waste drums stored in aboveground EM facilities required high-priority funding for safety and security. While most of these storage facilities were inexpensive to maintain, there were dozens of them across the complex, so the cumulative annual fixed cost was significant. The Review Team noted that, since certification and disposal of TRU waste were major cost drivers for the EM program, efforts to expedite shipments to WIPP and streamline regulatory procedures would result in obvious cost savings.

Finally, some spent fuel elements were being stored in wet storage basins that were old and had the potential to leak. The fuel basins at the Hanford K-Area, next to the Columbia River, contained about 2,100 metric tons of fuel and millions of curies of radioactivity. Hanford had started moving the fuel to a more secure and safe dry storage location away from the river. Given the rate of movement at the time, however, it would have taken more than 3 years to complete the transfer. In addition, possible single-point failures for key fuel-handling components posed much risk to the schedule.

**Current.** An IPT was formed to prepare a corporate plan for consolidation of SNM. The plan is to consolidate all plutonium at one or two sites and all enriched uranium at Oak Ridge. This plan permits security to be improved while at the same time eliminating threats to safeguards at numerous DOE sites. As an example, when Rocky Flats became a closure site, it had on site 15 tons of plutonium, safeguarded at a direct cost of $40 million per year and many more millions in lost productivity. To date, Rocky Flats has packaged 1,895 containers of

plutonium that are double contained and suitable for long-term (up to 50 years) storage. The site removed all special nuclear materials and eliminated the material accessibility area (MAA) by the end of FY03. The result is not only cost savings, but also improved national security and improved productivity for cleanup.

**Future.** All SNM will be stabilized, appropriately packaged, and either disposed of or placed in the custody of another departmental unit for safe storage and potential future use.

## 2. An Assessment of the Progress Made in Streamlining the Risk Reduction Process of the Environmental Management Program of the Department

**Past.** The Review Team found that the manner in which EM developed, solicited, selected, and managed many contracts was not focused on accelerating risk reduction and applying innovative approaches to doing the work. DOE's contracting strategies and practices made poor use of performance-based contracts for carrying out EM's cleanup mission. Processes for contract acquisition, establishment of performance goals, funding allocation, and government oversight were managed as separate, informally related activities rather than as an integrated corporate business process. This resulted in performance standards that were applied inconsistently and ineffectively.

EM's cleanup strategy was not based on comprehensive, coherent, technically supported risk prioritization. Many wastes were managed according to their origins, not their risk. This approach resulted in costly waste management and disposition strategies that were not proportional to the risk posed to human health and the environment. The framework and, in some cases, interpretation of DOE Orders and requirements, laws, regulations, and cleanup agreements created obstacles to achieving cleanup that would reduce risks to human health and the environment as quickly as possible. Instead, they resulted in resources being diverted to lower-risk activities. Additionally, there was no programmatic strategy for cleanup and closure, only a collection of individual site strategies that resulted in costly duplication and assignment of priorities on a local rather than national basis. Large quantities of surplus SNM were being stored at numerous EM sites. This scattered storage configuration was not optimum for safety and security, was expensive, and was difficult to manage.

**Current.** Many innovations and lessons learned for streamlining risk reduction were proven effective at Rocky Flats and are now being appropriately applied to other EM sites. Additionally, approaches to work on HLW at Savannah River are being applied effectively at Hanford. A systematic review of all EM site activities is under way to identify and encourage exchanges of beneficial practices. An IPT will visit each EM cleanup site to review work activities, management processes, and contract administration practices. This team will also assess the applicability of Rocky Flats lessons learned, and the sites will be directed to implement those lessons learned that are deemed beneficial and appropriate.

**Future.** Ensuring public health and safety and the safety of workers is an overriding requirement for any streamlining of risk reduction. In this context, EM has established a systematic approach for directing more resources to actual cleanup and closure, and giving

contractors incentives to take innovative approaches. All efforts will be focused on achieving approved risk-based end points rather than end points simply perceived as acceptable. Realistic and achievable goals will be established, and activities not directly related to cleanup and closure will be eliminated.

## 3. An Assessment of the Progress Made in Improving the Responsiveness and Effectiveness of the Environmental Management Program of the Department

**Past.** The Review Team emphasized that EM should redirect, streamline, or cease activities not appropriate for accelerated cleanup and closure. Many of these activities might be worthy of DOE or federal government support. If so, they should be transferred out of EM to another part of DOE or another federal agency. The team suggested further that EM's Science and Technology Program should be refocused to directly address the specific, near-term applied technology needs for cleanup and closure. Longer-term or more basic research and technology activities, programs, and laboratories not directly supportive of cleanup and closure should be transferred to other DOE programs. EM should also accelerate the consolidation of nuclear materials stored inefficiently at numerous facilities and sites throughout the country, noted the team. Accelerated consolidation of these materials would enhance safety and security, reduce threats, reduce risk, and save money.

The Review Team viewed the above recommendations as the next major step toward an improved EM program that could fulfill DOE's commitments to clean up the Cold War legacy. The team suggested that DOE could implement a number of these recommendations on its own and quickly. Others would require close work with Congress, state and federal regulators, the communities surrounding DOE sites, and other DOE stakeholders. The team noted that accomplishment of the EM mission will require major engineering efforts. Additional resources will be necessary in the next few years, but this investment will result in reducing risk more quickly and will produce major savings in life-cycle costs.

The Review Team emphasized that the EM mission cannot be accomplished by continuing business as usual. There must be major changes in all elements of the EM program. Once the necessary consensus for this approach has been achieved with regulators, stakeholders, and Congress, risk reduction will be accomplished by stabilizing high-risk materials; by decommissioning and decontaminating high-risk facilities; and by accomplishing cleanup and closure, including transfer of excess land areas to other entities for management. National security will be improved through the consolidation of all SNM in modern safeguarded facilities and through the accelerated disposal of TRU waste currently stored at numerous sites around the country.

**Current.** Two initiatives have proven to be particularly effective in improving responsiveness. The first has been an effort to improve acquisition strategy and contract management, as demonstrated by the procurement at Mound and the modification of PBIs at other sites, combined with configuration control. The second has been the creation of the IPTs. Members of these teams have been selected from among high-performing federal employees throughout the complex and assigned to develop projects leading to the implementation of all

initiatives identified by the Top-to-Bottom Review Team. The IPTs are following principles of project management and are preparing recommendations that represent an integrated approach to accomplishing these initiatives.

**Future.** The EM acquisition strategy is designed to reward contractors for outstanding performance by extending their contracts, consistent with contract provisions and applicable regulations. If performance is not outstanding, contracts will be modified or recompeted. In the EM organization, lines of accountability and responsibility are clearly defined, and managers will be held accountable for their actions or lack thereof. As project teams complete their missions, they will become part of the new organization, thus bringing newly trained project leaders into the day-to-day operations of EM.

## 4. Any Proposal for Legislation That the Secretary Considers Necessary to Carry out Such Initiatives, Including the Justification for Each Such Proposal

DOE has proposed or is supporting three actions that will require new legislation or legislative changes and are directly related to the accelerated cleanup and closure program. These three actions are to streamline the characterization of waste streams destined for WIPP, clarify the definition of reprocessing wastes to express the intent of Congress, and define the residue material in the silos at Fernald as 11e.(2) material. The proposed changes are briefly summarized below and discussed in detail in Section III of this report; if enacted, they will facilitate accelerated cleanup and closure at a reduced cost and result in faster and safer risk reduction.

### 4.A Waste Characterization Requirements for Disposal of Transuranic Waste in the Waste Isolation Pilot Plant

Congress has proposed legislation that would streamline the characterization of TRU waste streams destined for disposal at WIPP. DOE is supportive of this legislation because it represents a risk-based approach that would accelerate the disposal of TRU waste. This approach would not require sampling and analysis for hazardous waste and would be consistent with requirements in The Waste Isolation Pilot Land Withdrawal Act (Public Law 102-579).

### 4.B Definition of High-Level Waste

The proposed amendment clarifies the definition of "high-level radioactive waste" contained in Section 2(12) of the Nuclear Waste Policy Act of 1982, 42 U.S.C. 10101(12), by stating explicitly that material resulting from reprocessing (as well as any material commingled or contaminated with it) is not HLW if the Secretary of Energy, in consultation with the Nuclear Regulatory Commission (NRC) and after a period of time for public comment, determines that the material need not be permanently isolated by disposal in a deep geologic repository designed for the disposal of spent nuclear fuel to protect the public health and safety. The original 1982 definition implied but did not state that the Secretary, in consultation with the NRC, was

authorized to determine on that basis which reprocessing wastes are sufficiently radioactive to require disposal in the repository as "high-level radioactive waste."

### 4.C Waste Materials in Silos at DOE's Fernald Facility

The Fernald silo waste, like other materials regulated as 11e.(2) material, can be considered to be mill tailings. However, because the Fernald site was never licensed by the NRC or by an Agreement State under Section 274 of the Atomic Energy Act of 1954, as amended, the NRC has expressed concern that the Fernald silo waste does not fit its definition of byproduct material, and thus cannot be disposed of as 11e.(2) byproduct material at a licensed commercial facility. This legislation would resolve a gap in the complex regulatory regime governing low-activity wastes and permit timely disposal of the Fernald wastes in a licensed commercial disposal facility.

# III. Detailed Status Report

## 1. Reduction of Environmental Risks and Challenges That Are Faced as a Result of the Legacy of the Cold War

### 1.A Acquisition Strategy and Contract Management

The Top-to-Bottom Review Team recommended that all current performance-based contracting activities be reviewed and, where necessary, restructured to provide for focused, streamlined, and unambiguous pursuit of risk reduction. Most EM performance-based contracts were being employed inconsistently and with varying effectiveness. Additionally, the team's report recognized that EM acquisition processes required improvement on the part of both DOE and its contractors.

The Assistant Secretary fully supports the need to improve EM's performance-based contracting activities. Her vision for improving performance-based contracting requires a much broader overhaul of EM's entire acquisition process, including its methodology for formulating acquisition strategy, developing Requests for Proposals (RFPs), identifying performance-based incentives (PBIs), and providing government oversight of contractor performance. As a result, the Assistant Secretary initiated the following activities to overhaul EM's acquisition process:

(a) A systematic review of EM's entire acquisition process.

(b) A prompt evaluation of EM's in-process and upcoming contracting improvement opportunities.

(c) Review and modification of all EM performance incentives authorized for FY03.

(d) Formation of the Contract Management Advisory Council (CMAC) to institutionalize EM acquisition reform activities.

*(a) A Systematic Review of EM's Entire Acquisition Process*

In August 2002, the Assistant Secretary assigned a project manager to develop the EM IPT "Getting More Performance from Performance-Based Contracts." This project entails a systematic review of the entire EM acquisition process, with a focus on responding to the specific recommendations of the Top-to-Bottom Review Team.

The project was formally authorized in October 2002, when Critical Decision 0 (CD-0), Mission Need Statement, was approved. The project is structured to identify, plan, and implement activities that will:

- Refine and improve EM's processes for reviewing and approving contracting actions, including the incorporation of PBI fees in its contracts.
- Develop alternative business models to address specific EM contracting and subcontracting situations.
- Analyze the adequacy of the fees allowed in EM contracts.
- Develop specialized contracting training for EM managers.
- Develop procedures, guidance, and assistance for EM's source evaluation boards.

The project is scheduled for completion in October 2003.

*(b) A Prompt Evaluation of EM's In-Process and Upcoming Contracting Improvement Opportunities*

Many of EM's acquisition-related activities will require action before the "Getting More Performance from Performance-Based Contracts" project is completed in October 2003. Consequently, the Assistant Secretary directed a prompt review of all in-process and upcoming contracting events to identify opportunities for accelerating risk reduction.

This effort involves an EM review of all major business-related opportunities that will occur before October 2003. These include such events as recompetition of cleanup contracts, renegotiation of contractor performance incentives, release of EM's RFPs, and use of small-business opportunities and specialty contracts to achieve cleanup in lieu of using more expensive prime operating contracts for the same work.

EM's first complete effort involved the Mound closure. EM developed and released an RFP for cleanup of the Mound site in July 2002. This was the first RFP initiated, developed, and issued since the Top-to-Bottom Review, and it reflected EM's new approach for accelerated risk reduction. Table 2 shows the major acquisition-related issues raised in the Top-to-Bottom Review and addressed by the Mound RFP. Contract award occurred in December 2002.

Although the Scope of Work will be different in future RFPs, the Mound RFP will be the basic pattern for future EM solicitations. At the same time, EM's future acquisition strategy will involve a stronger focus on the following concepts:

- **Unbundling work**—EM will separate its cleanup work from the work of other DOE offices (i.e., Office of Nuclear Energy, Science and Technology; Office of Science; and National Nuclear Security Administration).

**Table 2. Top-to-Bottom Review Issues Addressed Within the Request for Proposals for the Miamisburg Closure Project**

| Top-to-Bottom Review Issue | Mound RFP Response |
|---|---|
| Performance goals are poorly defined. | • Statement of Work is clearly defined (i.e., Work Breakdown Structure format)<br>• Contractor selection is based on performance-based approach and schedules, not process, plans, etc.<br>• Fee payments are based on objectively determined performance metrics.<br>• A contractor perspective is used during RFP development. The source evaluation board is frequently challenged with "What does that mean?" |
| The contractor's problem-solving abilities are restricted. | • Contractors are given maximum flexibility to optimize their approach.<br>• The RFP includes frequent statements such as "Timing of demolition activities will not be constrained by the Government…" and "The contractor is encouraged to coordinate with the Contracting Officer to develop and execute innovative and graded approaches for removing facilities."<br>• Integrated Safety Management must be applied to "plan the right work." |
| Government oversight can be confusing and burdensome to both DOE and the contractor. | Government oversight of contractor work is defined in a contract clause and includes:<br>• A limited number of employees who can direct the contractor, formally identified by name (e.g., list of contracting officer's representatives).<br>• Knowledgeable DOE employees (trained and qualified, similar to the DOE Facility Representative program).<br>• An oversight approach that is formally documented and delivered to the contractor at contract award.<br>• Focus of government oversight on contract execution. |
| Uncertainty in work scope is not acknowledged by DOE or the contractor. | Work scope uncertainty is clearly identified in the RFP:<br>• DOE's understanding of uncertainty in the work scope is presented.<br>• The contractor's view of uncertainty in the work scope is solicited.<br>• Methods for minimizing impact on cost and schedule are solicited. |

| **Top-to-Bottom Review Issue** | **Mound RFP Response** |
|---|---|
| The contractor should be considered the primary customer of the RFP process. | • All reference material cited in the RFP is provided to the contractors.<br>• A preproposal conference lasts 1 week:<br>– Day 1: conference room discussion of RFP, cost incentives, etc.<br>– Days 2, 3, 4, and 5: tour of facility by DOE; every work element visited and discussed—environmental remediation sites, every building, every utility component to be removed. |
| Government-furnished services and items (GFSI) should be developed to clearly identify government responsible actions. | Risk-sharing principles contained within the GFSI clause in the Rocky Flats closure contract are continued. |

- **Driving innovation and improving cost performance**—To remove barriers preventing competition among smaller and smaller businesses, EM will identify discreet work elements that will be set aside for small and specialty businesses. These will not be the typical copy, janitorial, or staff support services, but will be substantive cleanup-related tasks.

- **Adopting a market-based approach that actively promotes rather than stifles innovation through competition**—At sites that are not making progress on accelerated risk reduction, contracts will be terminated and recompeted. In fact, unless there is clear evidence of outstanding performance, EM will initiate contract recompetition actions.

- **Emphasizing results-oriented recognition of outstanding performance**—At sites where the cleanup contractor has demonstrated outstanding performance through innovation and attainment of risk reduction end states, the contracts will be extended, consistent with applicable requirements, and opportunities for obtaining more PBI fees will be developed.

*(c) Review and Modification of All EM Performance Incentives Authorized for FY03*

Between August and September 2002, the Assistant Secretary directed a review of all PBIs associated with EM cleanup work scheduled to occur in FY03. This review examined DOE's effectiveness in targeting contractor fee incentives to risk-reducing cleanup activities.

The results of this review validated the observation of the Top-to-Bottom Review Team that EM contracts were not focused on risk-reducing cleanup activities. PBIs identify accomplishments the government values such that when they are achieved, the government pays the contractor an identified fee. The PBI review revealed that DOE placed high value on and consequently offered PBIs for many activities other than cleanup.

The PBI review identified numerous fee-bearing accomplishments that rewarded the contractor for completion of noncleanup activities, such as delivering reports, providing support services to the government, and complying with the contract. DOE was also paying contractors additional fees for meeting basic expectations of any contractor. For example, some contractors were paid fees for exceptional safety performance; essentially, they were incentivized to do work safely. DOE considers conducting work safely to be a basic expectation, not exceptional performance worthy of additional fee. If DOE cannot do work safely, its policy is not to do the work. If a contractor cannot perform work safely, DOE's policy is to replace the contractor. Additional basic expectations that were incentivized included:

- Providing best-in-class management and administration

- Providing effective contractor corporate support to DOE
- Providing customer focus and satisfaction

In response to this review, most PBIs for FY03 were restructured to provide a clear emphasis on completing cleanup activities and reducing risk, focusing on:

- Accelerating cleanup and site closure
- Aligning PBIs with individual Performance Management Plans (PMPs)
- Eliminating corporate performance PBIs and "paper" deliverables
- Providing objective measurements and challenging contractor opportunities
- Accomplishing meaningful cleanup and risk reduction

The restructured FY03 PBIs provide a "win–win" situation for both the government and the contractor. The government clearly offers PBIs for accomplishments it values—cleanup and risk reduction. Contractors benefit from increased clarity regarding their mission and have an opportunity to earn more fee. For example, before PBI restructuring, the tank farm contractor at Richland, Washington, was incentivized with $1 million to close one underground storage tank. After PBI restructuring, the tank farm contractor was incentivized with $29.5 million to close 26 tanks, with a further incentive of $2 million per tank to close an additional 14 tanks.

*(d) Formation of the Contract Management Advisory Council to Institutionalize EM Acquisition Reform Activities*

The Assistant Secretary directed that all changes made to the EM acquisition process be institutionalized. Consequently, in December 2002 the EM CMAC was formed. Its purpose is to advise the Assistant Secretary for Environmental Management on contracting issues and to serve as an interactive channel for addressing contracting services in support of the EM program. The council is responsible for:

- Developing contracting strategies for headquarters and field management contracts

- Making recommendations on extend/compete decisions for headquarters and field management contracts
- Reviewing the appropriateness and effectiveness of PBIs
- Reviewing contractor fee earnings
- Conducting special studies as directed by the Assistant Secretary or determined to be necessary by the CMAC

The scope of CMAC responsibility extends to all contracts awarded and administered by EM at headquarters, at those sites where EM is the designated Lead Program Secretarial Office, and at other sites where the primary purpose of the contract work scope is to support the EM mission.

**1.B Regulatory Agreements**

EM has formal cleanup agreements with federal and state regulators to fulfill the government's commitment to remediate the Cold War legacy of radioactive and chemical contamination. These cleanup agreements identify regulatory standards, cleanup requirements, waste disposal objectives, and end-state requirements for most of the EM cleanup mission. As described in the report of the Top-to-Bottom Review Team, however, EM has not been effective in reducing the risks presented by legacy waste. In many cases, the specific cleanup actions identified within EM's cleanup agreements can be resequenced to reduce risk more quickly. Therefore, EM intends to review each of its cleanup agreements in a collegial effort with the involved regulators to identify actions that can accelerate risk reduction.

Both state and federal regulators have supported DOE's strategy for accelerated risk reduction and cleanup. Letters of Intent supporting the objectives of the new strategy have been executed, PMPs have been developed, and the conduct of risk reduction and cleanup activities has begun. The extent of regulator agreement with the accelerated plans is evolving. At Oak Ridge, for example, DOE and its regulators have signed a Cleanup Plan Agreement that defines specific near-term goals. This agreement establishes a new set of enforceable commitments between DOE and its regulators, and has allowed DOE to manage the program to meet accelerated cleanup goals. In Colorado, the agreement between DOE and the regulators extends to a definition of the end state for soils and groundwater and the transfer of the site to management by the U.S. Fish and Wildlife Service.

At sites where current regulator agreements do not fully reflect the new accelerated risk reduction and cleanup strategy, DOE continues to work with the regulators to address their areas of concern. Agreements have been reached in some cases on specific opportunities for cleanup acceleration, and discussion continues in those cases in which resequencing of previously planned cleanups

may be necessary. DOE will continue to meet its current regulatory commitments while continuing to work with state and federal regulators to gain their support for the accelerated cleanup plans.

The development of a PMP at cleanup sites has allowed EM to identify a path forward for working with regulators to achieve accelerated risk reduction. As cleanup agreements are reviewed with all affected parties, the following elements are assessed because they present opportunities to accelerate risk reduction and therefore reduce the life-cycle costs of the EM program:

- Agreement milestones
- Resource Conservation and Recovery Act (RCRA) permit requirements
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Records of Decision
- Licenses and restrictions

Table 3 presents a summary of regulatory changes to support the site PMPs.

**Table 3. Regulatory-Related Activities That Support Performance Management Plans**

| Site | Letter Supporting the PMP Received From | Other Organizational Support |
|---|---|---|
| Battelle Columbus | Nuclear Regulatory Commission (NRC) | A license amendment to accelerate cleanup milestones at Battelle Columbus is in development. |
| Brookhaven | U.S. Environmental Protection Agency (USEPA) | Milestones in the Interagency Agreement (involving DOE, USEPA, and the New York State Department of Environmental Conservation) have been revised in accordance with the PMP. Changes to the milestones in the Interagency Agreement will be submitted as part of its annual update. |

| Site | Letter Supporting the PMP Received From | Other Organizational Support |
|---|---|---|
| Energy Technology Engineering Center | California State Department of Toxic Substances Control | |
| Fernald | USEPA, Ohio State EPA | |
| Hanford | USEPA, Washington State Department of Ecology, Oregon State Energy Office | |
| Idaho National Engineering and Environmental Laboratory | USEPA, Idaho State Department of Environmental Quality | |
| Lawrence Livermore National Laboratory | USEPA, California State Department of Toxic Substances Control, California State Regional Water Quality Control Board | |
| Los Alamos | | A draft Resource Conservation and Recovery Act (RCRA) administrative order for site cleanup was issued. |
| Mound | USEPA, Ohio State EPA | Federal Facility Agreement milestones are changed annually and will support the PMP. |
| Nevada | Nevada State Department of Conservation and Natural Resources (a Division of Nevada State EPA) | |

| Site | Letter Supporting the PMP Received From | Other Organizational Support |
|---|---|---|
| Oak Ridge | | The Oak Ridge Accelerated Cleanup Plan Agreement, signed by DOE, USEPA, and the Tennessee State Department of Environmental Conservation, implements the PMP. |
| Pantex | | USEPA and the Texas State Department of Natural Resource Conservation Commission are intimately involved in PMP strategy development. Issues are being addressed and resolved. |
| Sandia | | A draft RCRA Compliance Order for site cleanup was issued and supports the PMP. |
| Savannah River | | A letter of support for cleanup initiatives was prepared by the South Carolina Department of Health and Environmental Control. |
| Waste Isolation Pilot Plant | | Several RCRA permit modifications to increase disposal efficiency and waste acceptance are being reviewed by USEPA, NRC, and the New Mexico Environmental Department. Additionally, an amendment to the NRC TRUPACT-II certification for compliance for transport of high-gas-generation waste to WIPP was approved. |

Issues at the individual sites are being negotiated on a case-by-case basis. As indicated above, the regulatory agreement at Oak Ridge has been modified to incorporate the site's accelerated cleanup plan. At Idaho, Hanford, and Savannah River, the regulators have agreed in principle with the accelerated cleanup plans where cleanup activities have been accelerated, but they have not formally modified agreements to incorporate site plans, particularly for those lower-risk activities that have been deferred. The Ohio site regulators have expressed their commitment to supporting accelerated cleanup plans for the sites in that state, but they have also indicated that their support does not modify any of the rights, authorities, or obligations currently in place. At West Valley, there is currently no agreement on the preferred method of site closure. In Kentucky, DOE and the Environmental Protection Agency (EPA) have not reached agreement on acceleration of cleanup at the Paducah Plant. The regulators want DOE to honor its previous commitment to complete cleanup by 2010, while DOE is proposing acceleration of higher-risk activities to 2006, with the remainder of cleanup to be completed by 2015.

## 1.C Interim Storage and Final Disposition of High-Level Waste, Spent Nuclear Fuel, Transuranic Waste, and Low-Level Waste and Low-Level Mixed Waste

All of these legacy materials are currently being managed to ensure public and worker health and safety. Since the release of the Top-to-Bottom Review Team's report, EM has made significant progress in shifting from waste management to an aggressive effort at risk reduction. The PMPs that have been developed at all sites provide an initial baseline from which to measure corporate performance. Those baseline metrics are shown in the appendix to this report. Although these metrics represent an aggressive approach to cleanup, closure, and risk reduction, contractors are being challenged to seek ways of shortening the schedules and to find more cost-effective solutions.

### *High-Level Waste*

Priorities have shifted in the cleanup program to stabilizing and reducing the highest-risk sources. This change has caused all programs to be reevaluated and incentives to be created to refocus contractors on addressing the most urgent issues. High-level waste (HLW) management is the single largest-cost and possibly highest-risk element of the EM program. The safe management of HLW in the form of sludges, liquids, and salts in tanks, some of which are more than 50 years old, as well as its subsequent retrieval, pretreatment, final treatment, and disposal and facility closure, constitute the largest program costs. HLW is located at four sites (Savannah River, Hanford, Idaho, and West Valley). By far the major remaining problems are at Hanford and Savannah River. The HLW at West Valley has all been vitrified, and is stored awaiting shipment for storage and/or permanent disposal. The HLW at Idaho is mainly in the form of a stable calcine, which can be safely stored for many years. About 900,000 gallons of sodium-bearing liquid

waste is in the tank farms and can be solidified using the existing Idaho calciner or an alternative method. The product is expected to meet criteria for transuranic (TRU) waste.

A major change in the approach to handling tank waste at Savannah River and Hanford has come about from the realization that, based on risk and concentrations of long-lived isotopes, much of the tank waste is not HLW and does not have to be vitrified. As a result, 70 percent of the tank waste at Hanford can be treated more quickly and disposed of at lower cost than had been thought possible. Of the 35 million gallons in the tank farms at Savannah River, at least one-third can go to saltstone for disposal.

PMPs in place at both Savannah River and Hanford project major tank closures by 2006. Savannah River plans to close the F-Tank farm by 2006. This is an accelerated effort requiring removal of 50 million curies, closure of 2 tanks, emptying of 8 tanks, and placement of 10 compliant tanks in a dormant state. Richland now plans to empty up to 40 tanks by 2006, whereas until recently, there were no plans to empty tanks prior to 2006. Construction of a large vitrification plant at Hanford's Office of River Protection began in September 2002. Alternative stabilization methods are being investigated to augment vitrification of the low-activity waste in the Hanford tank farms.

*Spent Nuclear Fuel*

The most urgent risk reduction activity involving spent nuclear fuel (SNF) is taking place at Hanford, where 2,100 metric tons of heavy metal (MTHM) was stored in the K-Basins at the time N-Reactor was shut down. Much of this fuel has corroded and been exposed to water in the basins. The basins are not high-integrity and are located less than a quarter of a mile from the Columbia River. As of September 2003, 1,400 MTHM (70 percent) of the fuel had been removed from the basins, packaged for permanent disposal, and placed in dry interim storage at the Canister Storage Building. The remainder of the fuel will be removed from the basins by 2005. Water and radioactive sludge will then be removed and the basins deactivated. Also at Hanford, the on-site consolidation of SNF has continued. All SNF in the 300 Area has been moved to the central plateau, and 40 percent of the SNF in the T-Plant has been transferred to the Canister Storage Building.

Large quantities of SNF are also located at Savannah River and Idaho. Smaller quantities are located at Oak Ridge and West Valley, but will be consolidated at one of the larger sites. In Idaho, contractors have completed deinventory of two wet storage basins located at Test Area North (TAN) and at the Materials Test Reactor (MTR) canal, and placed the SNF in dry storage. At Savannah River, all SNF has been removed from the K-Basin and consolidated into the L-Basin—a more robust facility with good water chemistry. About 50 percent of the SNF has been removed from the Receiving Basin for Offsite Fuel, and removal will be completed

in FY04—a 2-year acceleration over the previous baseline. In addition, about 80 percent of the "at-risk" fuel has been processed in the canyons.

*Transuranic Waste*

Characterization, packaging, shipment, and disposal of TRU waste have increased dramatically since the release of the Top-to-Bottom Review Team's report. As Figure 1 shows, since February 2002, shipments received at the Waste Isolation Pilot Plant (WIPP) have increased from 10 per week to an average of 22 per week. From the perspective of volume of waste shipped, the number of TRUPACTs received increased from 18 to 47 per week over the same period (a 167 percent increase).

At Rocky Flats, 8,706 cubic meters of TRU waste was packed for shipment from February to May 2002. Idaho achieved a major milestone by shipping the last increment of 3,100 cubic meters to WIPP in December 2002. Hanford packaged 2,120 kg of residues for shipment to WIPP during February to December of 2002. And Savannah River packaged 210 cubic meters of TRU waste for shipment in the first quarter of FY03.

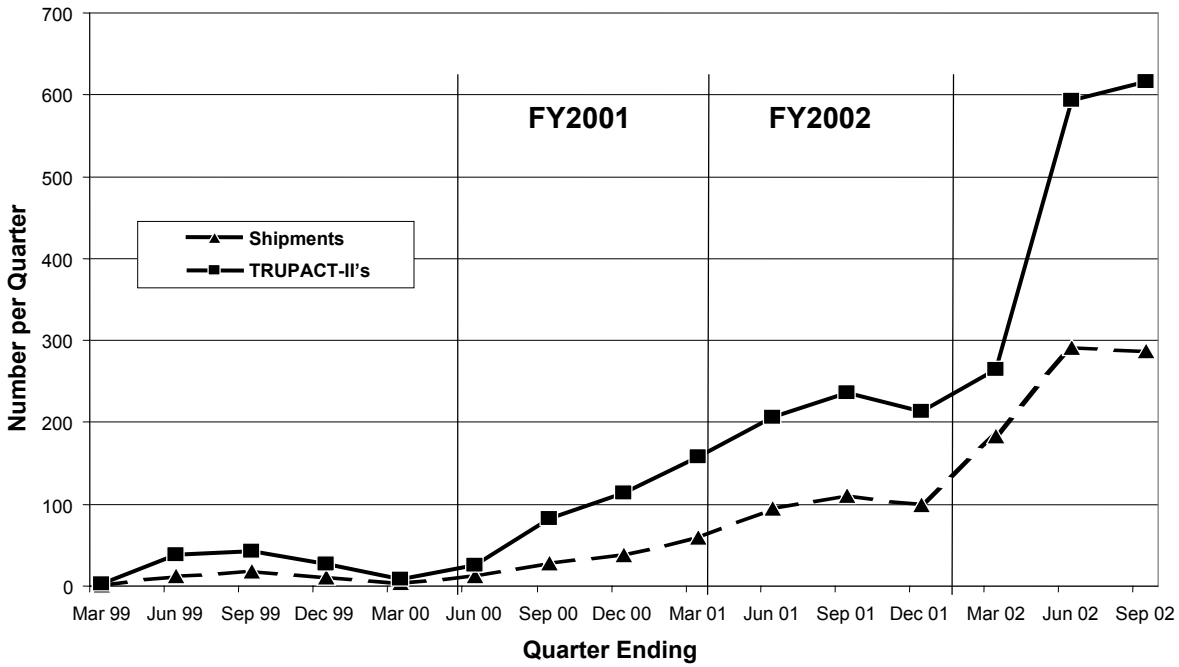



**Figure 1. Quarterly Waste Receipt at the Waste Isolation Pilot Plant**

*Low-Level Waste and Low-Level Mixed Waste*

Large quantities of low-level waste (LLW) have been disposed of since the report of the Top-to-Bottom Review Team was released. The waste has been disposed of both on site, and off site at Envirocare in Utah and at the DOE sites in Nevada and Richland, Washington. Active disposal cells are in use at Savannah River, Idaho, Hanford, Fernald, West Valley, Oak Ridge, and several smaller sites.

While there are no major technical issues preventing disposal of LLW, there are logistical and transportation issues due to the large quantities involved. As shown in the appendix, 336,000 cubic meters had been disposed of by the end of FY02, and another 300,000 will be disposed of by the end of FY05. In general, the most efficient transportation is by rail, but no rail services are available to the Nevada site, and waste must be trucked there. The availability of modern technology, involving the use of lined cells

and permanent caps over cells when disposal is complete, has in most cases resulted in agreements among regulators, DOE, and local communities for the construction and use of on-site shallow-ground disposal cells. Nevertheless, a need still exists for large central disposal sites.

A solution for a subset of low-level mixed waste (LLMW) (LLMW in the range of 10 to 100 nanocuries/gram plutonium) does not yet exist, and a number of sites have orphan material for which there is no disposal path and that could potentially prevent closure of a site. Most of the issues involve regulators and concerns related to state equity. Ongoing discussions are being held with both Washington State and the State of Nevada to resolve this issue.

### 1.D Closure and Transfer of Environmental Remediation Sites

The Top-to-Bottom Review Team observed that no programmatic strategy existed for closure of DOE sites with no future mission. The team recommended that DOE, in consultation with regulators and stakeholders, move on an urgent basis to define and implement a national strategy for cleanup of these sites.

The Secretary fully supports the need to develop an overall strategy for closure of DOE sites. His vision for achieving site closure includes a performance-oriented approach to consolidating, integrating, and accelerating closure activities. The following sites have a clearly defined, credible approach and are on track for accelerated closure:

- **Weldon Spring Site (Missouri)**—Site closure was completed in 2002. The site will be converted to a county park.
- **Rocky Flats (Colorado)**—Site closure is scheduled for 2006. The site will be managed by the U.S. Fish and Wildlife Service.
- **Fernald (Ohio)**—Site closure is scheduled for 2006. The site will be converted to a county park.
- **Miamisburg (Ohio)**—A new contract was awarded in December 2002 for site closure in 2006. The site will be converted to an industrial park and transferred to the city of Miamisburg.

For other sites at which a clearly defined, credible approach to closure is needed, the Secretary intends to proceed with an approach that develops clearly defined programmatic paths for:

(a) Agreement with regulators on a vision for accelerated risk reduction

(b) Disposition of waste material, including HLW and SNF

(c) Identification of cleanup end states to support site closure

(d) Development of a credible closure plan for DOE's small sites

In support of the Secretary's vision, the Assistant Secretary initiated the following actions to address each of the four areas listed above.

*(a) Agreement with Regulators on a Vision for Accelerated Risk Reduction*

EM has formal agreements with regulators to fulfill the government's commitment to remediating legacy radioactive and chemical contamination left over from the Cold War. These cleanup agreements identify regulatory standards, cleanup requirements, waste disposal objectives, and end-state requirements for most of the EM cleanup mission. However, as described by the Top-to-Bottom Review Team, EM has not been effective at reducing the risks presented by legacy waste. The team suggested that, in many cases, the specific cleanup actions identified in EM's cleanup agreements could be resequenced to reduce risk more rapidly. Therefore, as described earlier in Section 1.B, "Regulatory Agreements," EM reviewed each of its cleanup agreements in a collegial effort to focus on genuine accelerated risk reduction and site closure.

*(b) Disposition of Waste Material, Including HLW and SNF*

Disposition of waste material is a major element of each site closure plan. Consequently, the Assistant Secretary initiated the following corporate-level projects to identify and plan waste disposition activities that will allow the accelerated risk reduction goals of the PMPs to be achieved.

**Project: "Managing Waste to Reduce Risk—High-Level Waste (HLW)."** DOE currently manages HLW according to its origin and not the risk it poses. This approach has resulted in costly waste management and closure strategies that are not considered proportional to the risk posed to human health and the environment. The challenge for this project is to develop and define tank waste retrieval, processing, disposal, and closure alternatives that permanently dispose of waste in the tanks consistent with the risk posed, at a faster rate and lower cost than in the current baseline. The team will make recommendations emphasizing performance rather than prescriptive standards, expediting tank closure, and focusing on disposal of high-curie, long-lived isotope materials in geologic repositories.

**Project: "Integrated/Risk-Driven Disposal of Spent Nuclear Fuel (SNF)."** The purpose of this project is to identify, plan, and recommend an integrated corporate strategy for management of DOE's SNF activities. It is important to note that this project will develop a DOE corporate SNF strategy, not a parochial EM SNF strategy. The corporate strategy will be focused on reduction of environmental and programmatic risks, project acceleration, and identification of means for achieving programmatic streamlining and cost-efficiencies. The need for this project and the development of such an integrated strategy was identified by the Top-to-Bottom Review Team.

This project is key to the implementation of the EM reform initiative recommended by the Review Team. The project will be the focal point for delivery of the SNF-related government-furnished services and items (GFSI) required to support the sites' accelerated cleanup plans.

The corporate strategy for SNF disposition developed under this project will strengthen EM's management of SNF, as well as integrate EM's SNF activities with the programmatic baselines of other DOE organizations. Through the use of formal, integrated project management tools, opportunities for optimization and complex-wide acceleration of SNF disposition will be identified, thereby enabling life-cycle cost savings.

**Project: "Managing Waste to Reduce Risk—Other Than HLW and SNF."** LLW, LLMW, and TRU waste have unique characteristics and pose unique disposal challenges. This project will develop, deliver for approval, and initiate an Integrated Disposal Plan for each of these waste types.

These plans will addresses EM's responsibilities for generation, storage, treatment, packaging, and disposal of the respective waste types. The plans will specifically identify short- and long-term improvements and best management practices in a manner that allows maximum flexibility in implementing the plans and ensuring accelerated risk reduction across the complex. The short-term improvements will also be described in incremental interim reports known as Immediate Risk Reduction Action Plans, allowing for immediate implementation and building success as the project moves toward completion.

**Project: "Safeguards and Security/Nuclear Material Consolidation."** The most effective method for improving safeguards and security for nuclear material under the purview of EM is to properly dispose of the material, and thereby eliminate the need for safeguards and security. EM's objectives for this project are presented below in Section 1.F, "Consolidation of Special Nuclear Material and Improvements in Safeguards and Security."

*(c) Identification of Cleanup End States to Support Site Closure*

The Assistant Secretary initiated the corporate-level project "A Cleanup Program Based on Risk-Based End States" to develop, deliver for approval, and initiate an integrated approach for shifting the DOE cleanup program from one dominated by individual compliance-based activities to one focused on achieving clearly defined, risk-based end states. Once a site closure end state has been identified, all cleanup-related activities can be directed at its achievement more effectively.

Once completed, this project will have developed and deployed the analytical and communication tools needed to identify site-specific risk-based end states. Additionally, a DOE corporate strategy will have been developed to describe how those analytic tools will be used, how DOE's overall end-state identification process will work, and how DOE will coordinate with regulators and stakeholders to converge on a risk-based end state for each closure site.

*(d) Development of a Credible Closure Plan for DOE's Small Sites*

The Assistant Secretary initiated the corporate project "Integrated Program for Accelerating Cleanup of Small Sites" to identify, develop, and deliver for approval credible cleanup plans for achieving site cleanup and closure in accordance with the applicable PMPs. This project is structured in two phases. The first phase focuses on sites scheduled to close by 2006; the second addresses all sites scheduled to close after 2006.

The project team has interacted with a total of 36 small sites to review their detailed plans (i.e., cleanup project baselines) for site closure. The project team brings to each site a national perspective that includes:

- Best practices for cleanup completion and site closure
- Approaches to life-cycle cost reduction
- Innovative and closure-oriented contracting strategies and tools

- Collaboration and integration with other DOE sites
- Waste disposition opportunities and strategies

Once its work is completed, the project team will have interacted with each site scheduled for closure by 2006 and developed a credible plan for achieving closure in accordance with the applicable PMP.

## 1.E Achievements in Innovation by Contractors of the Department with Respect to Accelerated Risk Reduction and Cleanup

The Top-to-Bottom Review Team described the EM program as lacking a project completion mindset, along with an appropriate sense of urgency. The team's report provided detailed calls to action to help EM regain management control of its cleanup program.

Despite the Review Team's observations, EM has been successful with some cleanup projects. These successes have produced a substantial inventory of proven strategies and methods for accelerating risk reduction within the cleanup mission. The most successful large-scale project is currently occurring at Rocky Flats, where significant improvements in closure schedule and cost have occurred.

Figure 2 illustrates the successful accelerated risk reduction effort at Rocky Flats. In 1997, Rocky Flats cleanup was estimated to cost $17.1 billion and last until FY45. As of 2002, site closure was estimated to cost $7.1 billion and be completed in FY06. The major initiatives producing this dramatic acceleration are captured and summarized in six lessons learned:

(a) Insisting on an uncompromising pursuit of top performance

(b) Creating and implementing a closure "project"

(c) Implementing a performance-based contractual strategy

(d) Employing innovative project planning and delivery

(e) Effectively managing human resources

(f) Innovatively applying technology and requirements

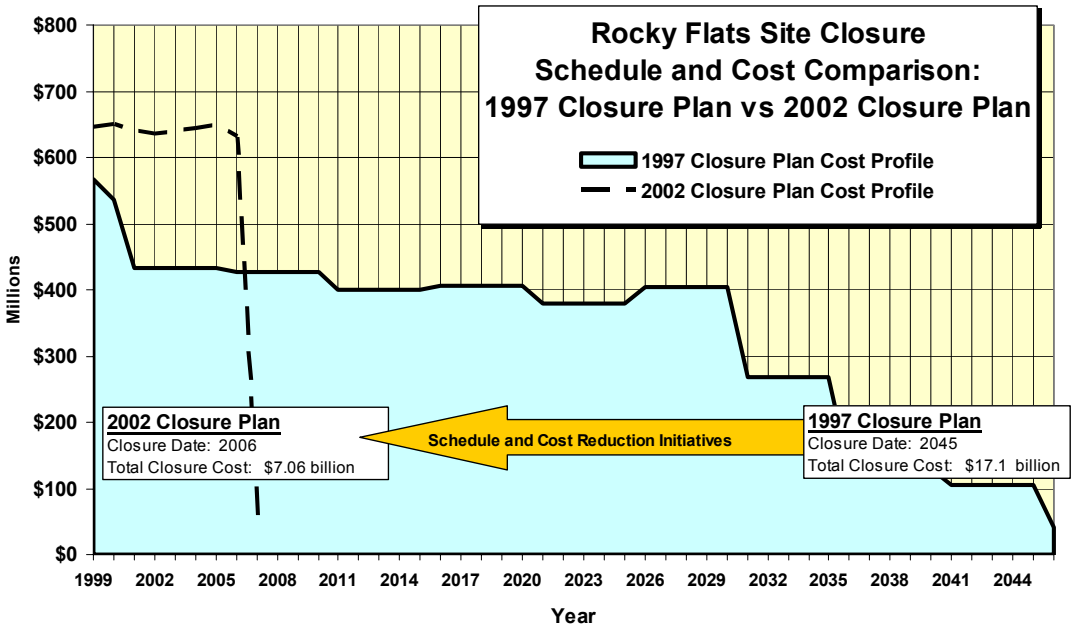



**Figure 2. Accelerated Closure of Rocky Flats**

EM intends to apply the above lessons learned from Rocky Flats as appropriate to other cleanup sites with similar work scope, cleanup missions, and contracts. The EM corporate project "Focusing EM Program Resources on Cleanup," authorized in October 2002, is designed to eliminate activities funded by EM that do not contribute to accelerated risk-based cleanup. To accomplish its mission, the project team will visit each EM cleanup site and review work activities, management processes, and contract administration practices. Additionally, as these visits are made, the project team will assess the applicability and potential benefits to each site of the lessons learned at Rocky Flats. If lessons learned are applicable, the site will be directed to implement them.

The lessons learned during the Rocky Flats closure project are being recorded in detailed form under an effort titled "The Closure Legacy Project," sponsored by the Rocky Flats Field Office. The project team for EM's "Focusing EM Program Resources on Cleanup" project is using clearly defined checklists to examine the applicability of the Rocky Flats lessons learned to each site. The following are summary descriptions of each lesson learned.

*(a) Insisting on an Uncompromising Pursuit of Top Performance*

Senior DOE and contractor managers must set clear performance expectations within their organizations. At Rocky Flats, the pursuit of improved performance has been clearly established as an expectation by the senior managers within the Rocky Flats Field Office and Kaiser-Hill Company. Without such clear leadership displayed by senior managers, no significant progress in cleanup and risk reduction will occur. Other organizations may try to replicate the Rocky Flats lessons learned; however, without clearly demonstrated leadership from senior DOE and contractor managers, the results will not be as dramatic or effective.

*(b) Creating and Implementing a Closure "Project"*

Successfully pursuing accelerated closure at Rocky Flats has required the creation and implementation of a closure "project." That is, the approach for cleanup and closure of Rocky Flats needed to be described with clearly defined start and end dates, specific project milestones, budget plans, and performance criteria. Accelerated closure has also required transitioning the culture of the workforce, both DOE and contractor, from production/operations to closure. Implementing the closure project became possible with the development and validation of an accelerated closure vision and an effective closure project baseline. That baseline is work activity–based and establishes a schedule for activity completion, as well as estimated project costs. The baseline defines the plan for executing the accelerated closure project and allows progress to be measured. In addition, the milestones and end points outlined remain fixed throughout the life of the project.

The site's aggressive vision and commitment to closure have formed the foundation for an achievable project made possible by the application of project planning tools. Creating a project plan that challenged a workforce with a previously unclear operating mission to embrace a mission firmly committed to accelerated closure has required leadership and focus. Applying and in some cases creating the systems needed to accelerate closure, in parallel with undertaking organizational changes, has made the closure of Rocky Flats in 2006 an attainable goal.

*(c) Implementing a Performance-Based Contractual Strategy*

Traditionally, DOE management and operating (M&O) contracts have been cost-reimbursable for operating sites with a defined production mission, and have not provided well-defined performance criteria or expectations for environmental cleanup and closure work. M&O contractors have been relieved of most financial risk for poor environmental cleanup and closure efforts, resulting in few drivers for contractor accountability. Performance expectations have not been clearly specified, contractors may not have been sufficiently incentivized to accomplish work, and performance measurement has typically been subjective.

The Rocky Flats closure contract between DOE and Kaiser-Hill, signed in January 2000, has the singular focus of completing the cleanup and closure of the Rocky Flats Environmental Technology Site in the safest, most cost-effective manner possible, with a target completion date of December 15, 2006. The terms and conditions of the contract reflect an important evolution in the approach to contract development at Rocky Flats over a number of years. The fee incentives provided to the contractor will be significant if accelerated closure of Rocky Flats is achieved by December 2006 or earlier.

*(d) Employing Innovative Project Planning and Delivery*

Specific aspects of project planning and delivery initiated at Rocky Flats are listed below, along with the associated savings and benefits:

- A clear end-state vision and risk-based cleanup levels are defined in conjunction with specific future land/site use.
- Recognition and incentives are provided to the workforce to motivate the achievement of closure. Significant personal incentives are tied to achieving project goals.
- A "best-in-class" management team has been recruited and sustained. The result is a team focus and retention of key staff.
- The organizational structure of the project fosters internal competition, a mission focus, and flexibility. Management layers have been eliminated.
- Senior management emphasis is placed on the following safety issues:
  - Keeping the workers working
  - Minimizing the risk of high-impact events
  - Quick recovery after incidents
  - Safety "pauses" as appropriate
  - Improved safety training
  - "Big 5" safety awareness (electricity, falls, heavy lifts, fire, equipment operations)
  - Establishment of a Safety Assessment Center to quickly assess every safety issue

- An integrated project baseline schedule and budget have been developed and are being used to:
  - Accomplish accurate and timely reporting and adjusting.
  - Treat overhead and level-of-effort activities as real projects.
- Partnering with DOE avoids unnecessary project delays and costs (e.g., original plans involved significant processing of residues; orphan waste issues are being resolved).
- The project operates under a clear and concise prime contract. A well-defined change control process eliminates the performance of nonmission work.
- The project is managed in an environment that provides significant incentives for real cost savings.
- Unnecessary requirements are constructively eliminated.
  - Those not directly related to the project are eliminated.
  - A business management model is used.
- A commercially oriented subcontracting strategy has been defined to simplify and speed up the process:
  - Development and implementation of a "commercial" subcontract model for award of major decontamination and decommissioning (D&D) subcontracts (Building 111 model)
  - Bundling and consolidation of multiple subcontractors under task-type subcontracts awarded to the "best" subcontractors (eliminating approximately 100 vendors)
  - Implementation of funds controls, significantly reducing the number of task orders issued to subcontractors
- The GFSI model is used to integrate and manage the delivery of items not within the control of Kaiser-Hill.

*(e) Effectively Managing Human Resources*

The following specific human resource elements have contributed to accelerated risk reduction at Rocky Flats:

- Workers' compensation insurance is provided under a "wrap-up" program provided by Kaiser-Hill, not by individual companies.
- Benefits programs (health, vacation, sick leave, etc.) for salaried employees have been reduced to market level.
- Pension fund contributions have been reduced by merging salaried and union plans.
- Separation (termination) programs have been restructured, eliminating voluntary participation.
- A health maintenance organization (HMO) subcontract has been competitively bid.
- Hourly employees' medical and dental contributions have been changed from post- to pre-tax calculation.
- An incentive-based collective bargaining agreement (CBA) has been negotiated through site closure. For numerous CBA changes and enhancements, Kaiser-Hill has received:
  - More time each day devoted to actual work
  - Improved safety focus
  - Labor flexibility (composite crews)
  - Labor stability and retention
  - Fewer grievances
  - Avoidance of bumping turmoil
  - Flexibility in layoffs (curtailments)
  - A CBA through the end of the project

*(f) Innovatively Applying Technology and Requirements*

The following specific technology-related measures have provided significant savings at Rocky Flats:

- Implementation of new technology ideas has significantly accelerated schedule and reduced costs:
  - A Decommissioning Basis for Interim Operation has been developed that allows safety requirements to self-delete as risks in the building/area are reduced.
  - Improved decontamination techniques (e.g., use of cerium nitrate), coupled with new radiation instrumentation, have dramatically reduced the amount of TRU waste processed.
  - Use of the instacote process allows sprayed-on material to serve as an acceptable container for shipment to the Nevada Test Site.
  - Foam is used in LLW containers to provide a solid mass and avoid blocking and bracing.
  - Streamlining of the reconnaissance-level characterization includes innovative use of historical data and use of large-area detectors.
  - The project is taking advantage of the U.S. Department of Transportation regulation that allows shipment of "surface-contaminated object (SCO)" LLW.
  - New and innovative equipment and methods are being used for size reduction (e.g., plasma cutting torch, engineered enclosures, water-jet cutting of components), significantly improving safety and productivity.
  - Environmental remediation protocols between Rocky Flats and Colorado state regulators have been clarified and improved.
  - Explosives are being used for demolition work, rather than labor-intensive manual demolition techniques.
- Information technology infrastructure has been streamlined and wireless telecommunications deployed:
  - Dedicated phone lines, cabling, etc. have been eliminated.
  - Most radios have been eliminated.
  - The number of servers has been reduced.
  - Encrypted communications have been provided for sensitive unclassified nuclear information between geographically separated offices.

- Thin client terminals have been deployed to reduce the cost of traditional PC workstation equipment and maintenance.
- Alternative integrated voice devices have been provided for mobile site workers.

### 1.F Consolidation of Special Nuclear Material and Improvements in Safeguards and Security

Several sites participating in the accelerated cleanup and closure program have significant quantities of special nuclear material (SNM) that require major expenditures to meet safeguards and security requirements. Since most of these materials have no programmatic need, they must either be disposed of as waste or transferred for storage to an appropriate DOE program office that may have a future need for them.

Many of the EM legacy sites were part of the Cold War production complex. During the production era, plutonium was considered a major asset. Aggressive measures were instituted to recover plutonium for weapons production. As a result, thousands of kilograms of plutonium that is considered disposable waste today was kept in the inventory under stringent safeguards and security.

The initiative to dispose of plutonium-bearing waste and to package and consolidate SNM has been treated as a priority at the highest levels of DOE. This effort is urgent both because it is vital to homeland security and because it is essential to the achievement of cleanup and closure. Since the release of the report of the Top-to-Bottom Review Team, significant progress has been made in this area at Rocky Flats, Savannah River, and Hanford.

This progress included packaging of 8,700 kg of bulk plutonium-containing residues at Rocky Flats and 1,500 kg of bulk plutonium-containing residues at Hanford for shipment to WIPP. Plutonium and plutonium oxide to be stored at Savannah River must be packaged in double-containment stainless steel containers called "3013 containers." Since February 2002, 1,895 of these 3013 containers have been produced at Rocky Flats and 1,340 at Hanford. Because of an emphasis on disposal instead of storage, about 2,000 kg of plutonium-bearing materials at Rocky Flats will be sent to WIPP instead of Savannah River. Removal of plutonium from Rocky Flats is complete.

## 2. An Assessment of the Progress Made in Streamlining the Risk Reduction Process of the Environmental Management Program of the Department

The ability to streamline EM's risk reduction process requires the implementation of three measures: (1) recompeting or renegotiating contracts to provide incentives for accelerating risk reduction, and applying innovative approaches to doing the work; (2) basing those incentives on comprehensive, coherent, technically supported risk prioritization; and (3) developing a clear understanding of the required end state. Perhaps most important is the aggressive incorporation of lessons learned as the cleanup program proceeds.

The first step in the streamlining process has been to establish PMPs at each site. These PMPs describe the work plan, priorities, and schedule for achieving the cleanup objectives. The PMPs that have been approved are being used to renegotiate contracts and establish contractor incentives to perform the work. As discussed in Section 1.B on regulatory agreements, the PMPs are also used to identify areas in which issues must be resolved with state and EPA regulators. The most beneficial use of the PMPs is for identifying life-cycle costs and areas in which costs can be reduced and schedules accelerated. The PMPs are used as the base from which additional improvements can be made and are expected. Figure 3, based on current PMPs, illustrates the understanding of acceleration already put in place.

The approach for recompeting or renegotiating contracts was discussed in detail in Section 1.A. In summary, the approach involves systematic review of EM=s total acquisition process, to be completed by October 2003; a prompt review of EM=s in-process and upcoming contracting improvements occurring before October 2003; a detailed review of all EM PBIs authorized for FY03; and creation of the CMAC.

Basing contractor incentives on accelerated risk reduction criteria is a clear outcome of the new PBIs and approved PMPs. The establishment of a focus on reducing or eliminating the highest risks first has resulted in shifting priorities from activities involving low-risk remediation or unrelated to cleanup to those involving reduction of high risks (e.g., stabilization of HLW).

The Top-to-Bottom Review Team made a strong statement on risk assessment and prioritization. In summary, the team's report stated that EM was managing risk, not reducing risk to public health and safety and the environment. The team suggested that the overarching guideline for implementation should be to accelerate risk reduction while protecting the health and safety of workers and the public, protecting the environment, and improving national security.

Under the risk management scenario of the past, emphasis was placed to a great extent on isolation and containment of the source, rather than its reduction. The focus was on ensuring that all of the DOE Orders and requirements for environment, safety, and

health were being met and that an Integrated Safety Management System was in place. In other words, risks were being managed to protect workers, the public, and the environment, but the emphasis was not on reducing risk. As a result, cleanup, closure, and safe disposal of high-risk materials and facilities would not have been accomplished in the next 50 years.

The new accelerated risk reduction and cleanup strategy is focused on reducing or eliminating the highest risks at sites with continuing missions. For cleanup and closure sites, an end point will be defined that is based on technical risk evaluation and realistic criteria for the end state, as well as a defined program for long-term monitoring. The emphasis at these sites will be on accelerating cleanup and closure to the defined end point.

The approach recommended by the Top-to-Bottom Review Team requires attacking some of the most difficult problems early on. Risk reduction is to be accomplished by (1) eliminating the risk, (2) avoiding the risk, or (3) mitigating the risk. For example, risk is eliminated at one site and reduced to a very low level at another when TRU waste is packaged and disposed of safely at WIPP. The risk of contaminants from the Hanford K-Basins entering the Columbia River is eliminated when the fuel is placed in dry storage and the basins decontaminated. Risk is eliminated when such tasks as size reduction can be avoided. And risk can be mitigated by placing materials in a more stable form (e.g., converting high-curie HLW from a liquid to a solid).

The technical risk assessment and the prioritization effort for each site should encompass two stages. The first is based on a knowledgeable understanding of the work to be done; the nature of the hazards involved; and the risk those hazards pose for the environment, worker safety, and public health. This stage is discussed in broad terms in the Top-to-Bottom Review Team's report. For example, the report identifies all highly radioactive waste stored in tanks, SNF, all SNM, and some TRU waste as high-risk materials.

The second stage also involves engineering judgment, but may require more detailed analyses of data and the use of risk assessment tools. In this stage, site-specific issues (e.g., geology, groundwater) are to be considered, as well as the condition of individual tanks, buildings, and equipment.

Using this simplified approach to risk reduction, the Stage 1 items to be identified as high-risk were selected. They are as follows:

- Liquid waste containing high-curie, long-lived isotopes
- SNM
- Liquid TRU waste in tanks

- Sodium-bearing liquid waste in HLW tanks
- Defective SNF in water basins
- SNF in basins that are leaky or have poor water chemistry
- Wastes with high transuranic content (>100 nanocuries/gram)
- TRU waste stored on the surface
- Remote-handled TRU (RH-TRU) waste
- D&D of highly contaminated facilities

All of the above items should be considered when setting priorities and establishing contractor incentives, but their relative ranking may vary from site to site. For example, removal of SNF from the K-Basins at Hanford is clearly the highest priority because contaminated leaks from those basins have a short, direct path to the Columbia River. On the other hand, a much lower priority can be placed on the removal of fuel from the L-Basin at Savannah River because it is expected that good water chemistry and high integrity of the basin can be maintained for many years.

Since safe disposal of many of these materials will take a number of years, the Top-to-Bottom Review Team recommended first stabilizing all high-risk materials (e.g., converting liquids to solids or converting unstable plutonium compounds to metal or oxide and packaging them for long-term storage). Once stabilized, the materials can be safely stored for a long time with much lower risk until the final disposal process has been approved and the disposal facility constructed.

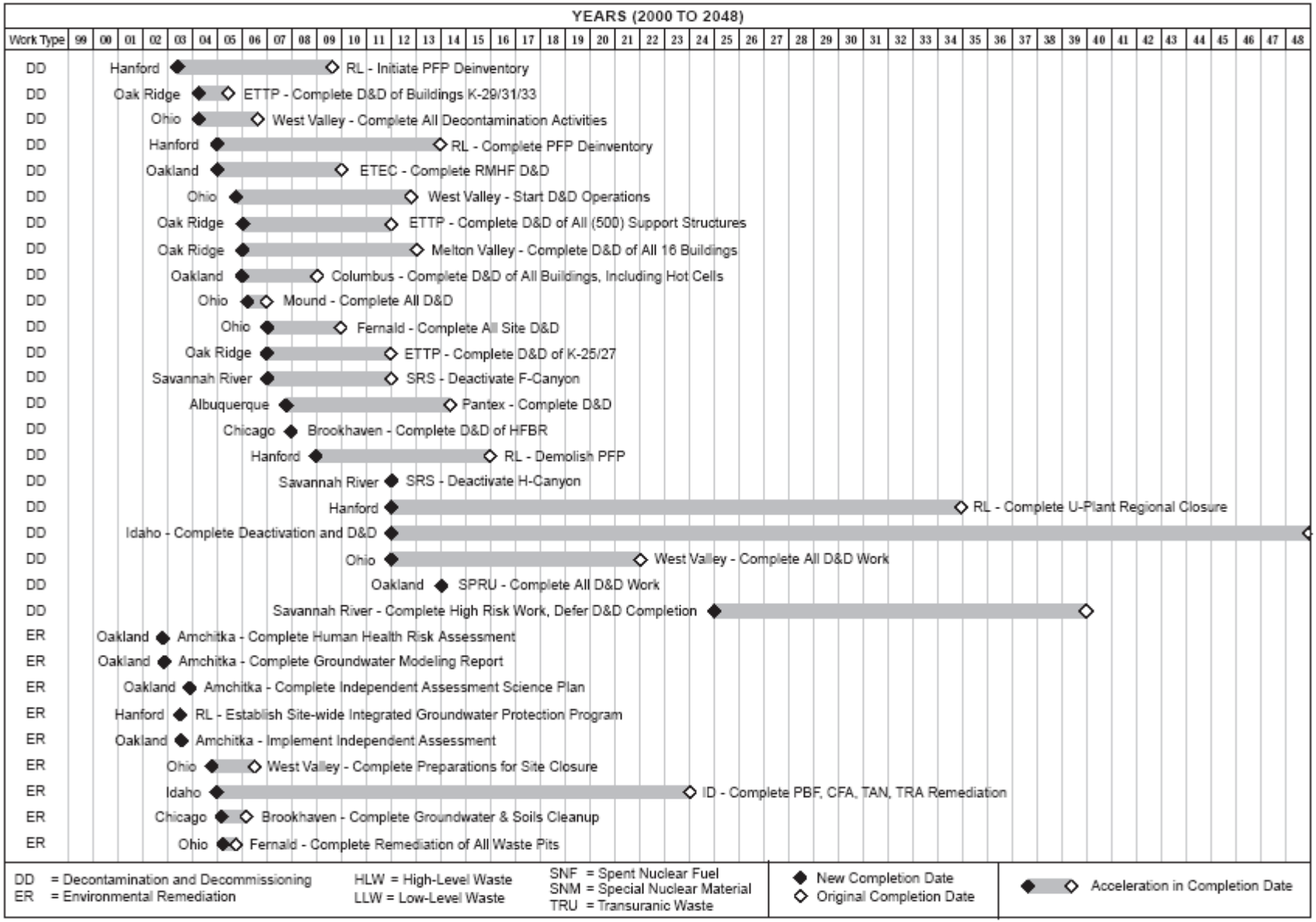
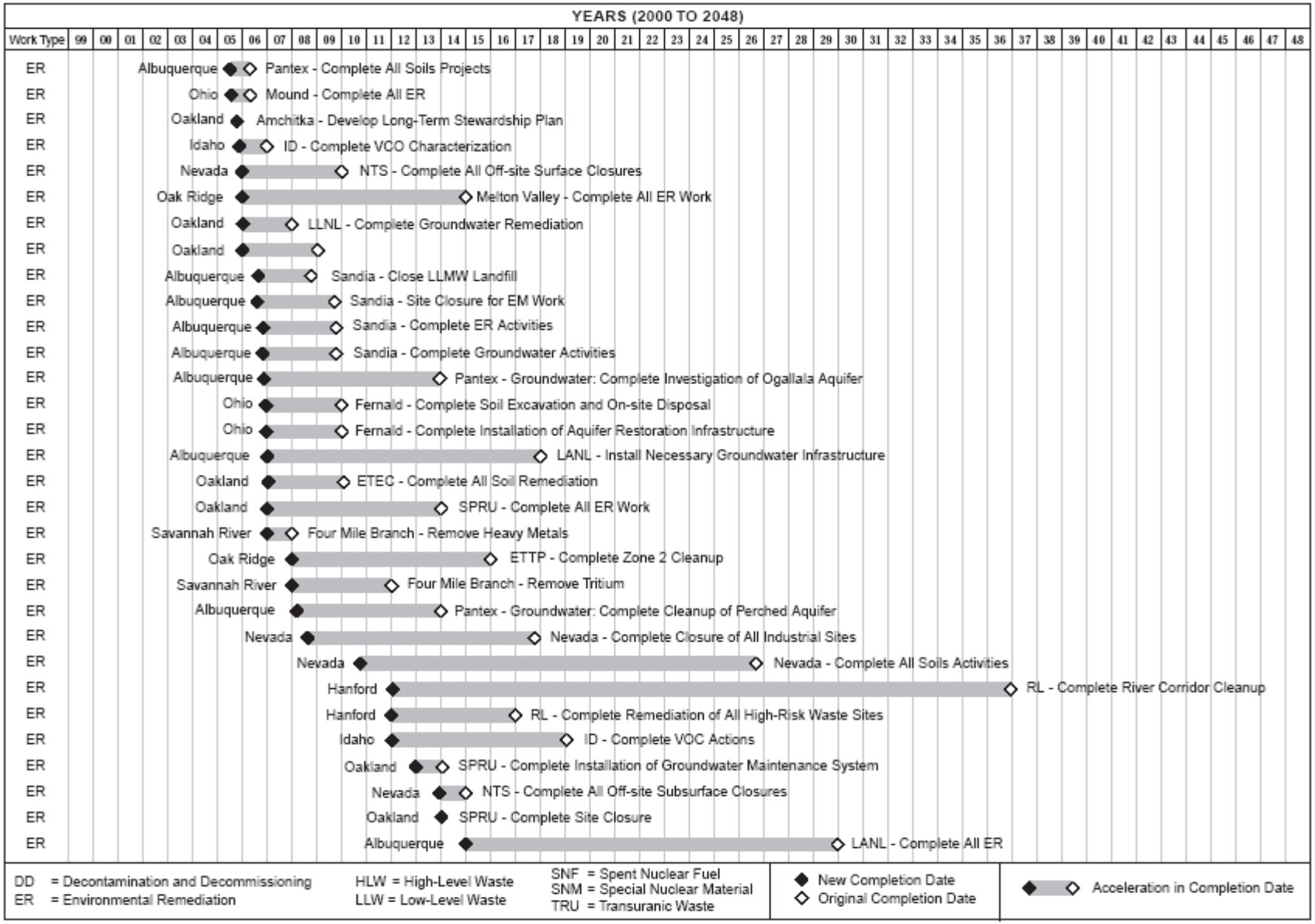



**Figure 3. Accelerated Risk Reduction Activities in Performance Management Plan**

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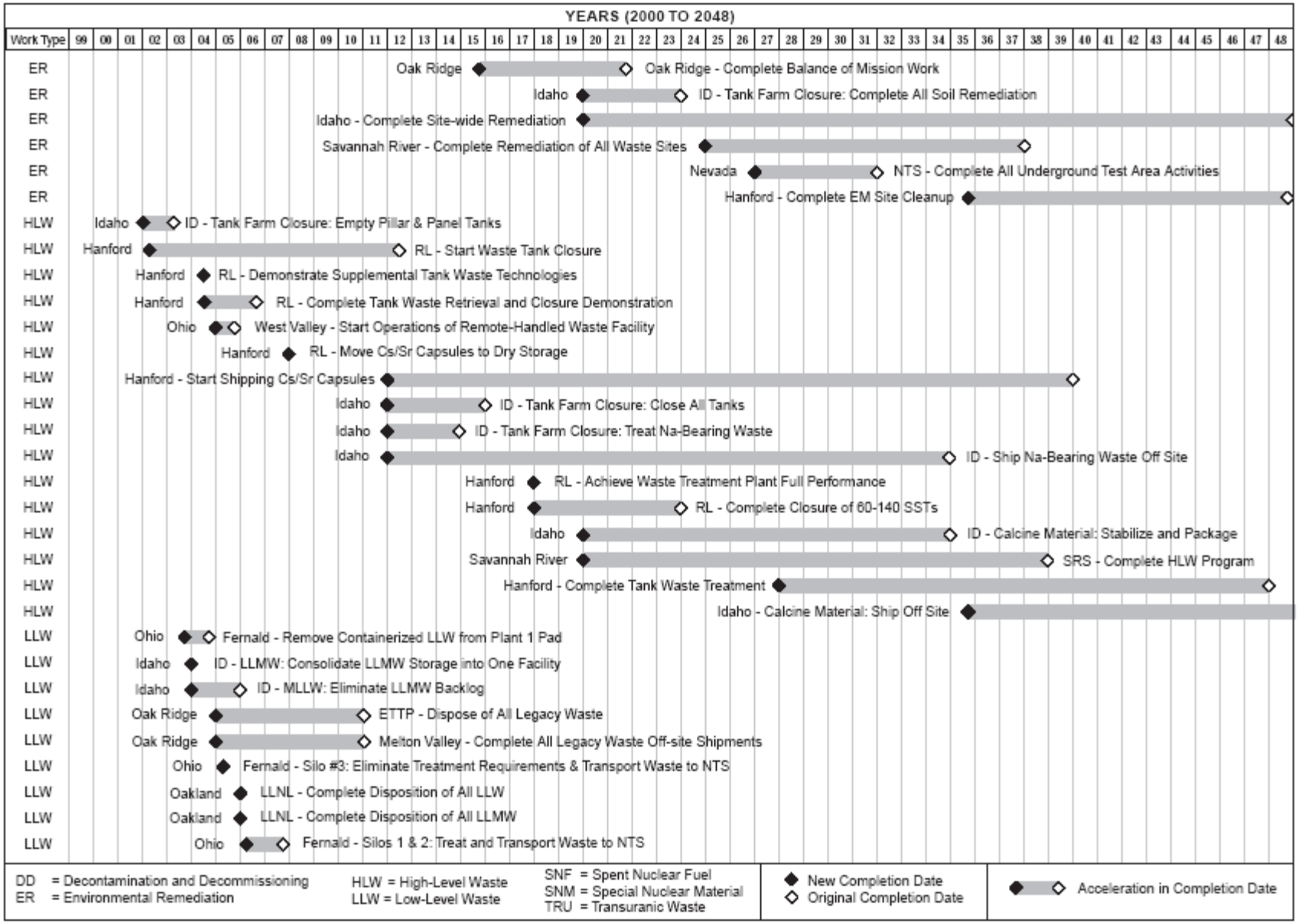


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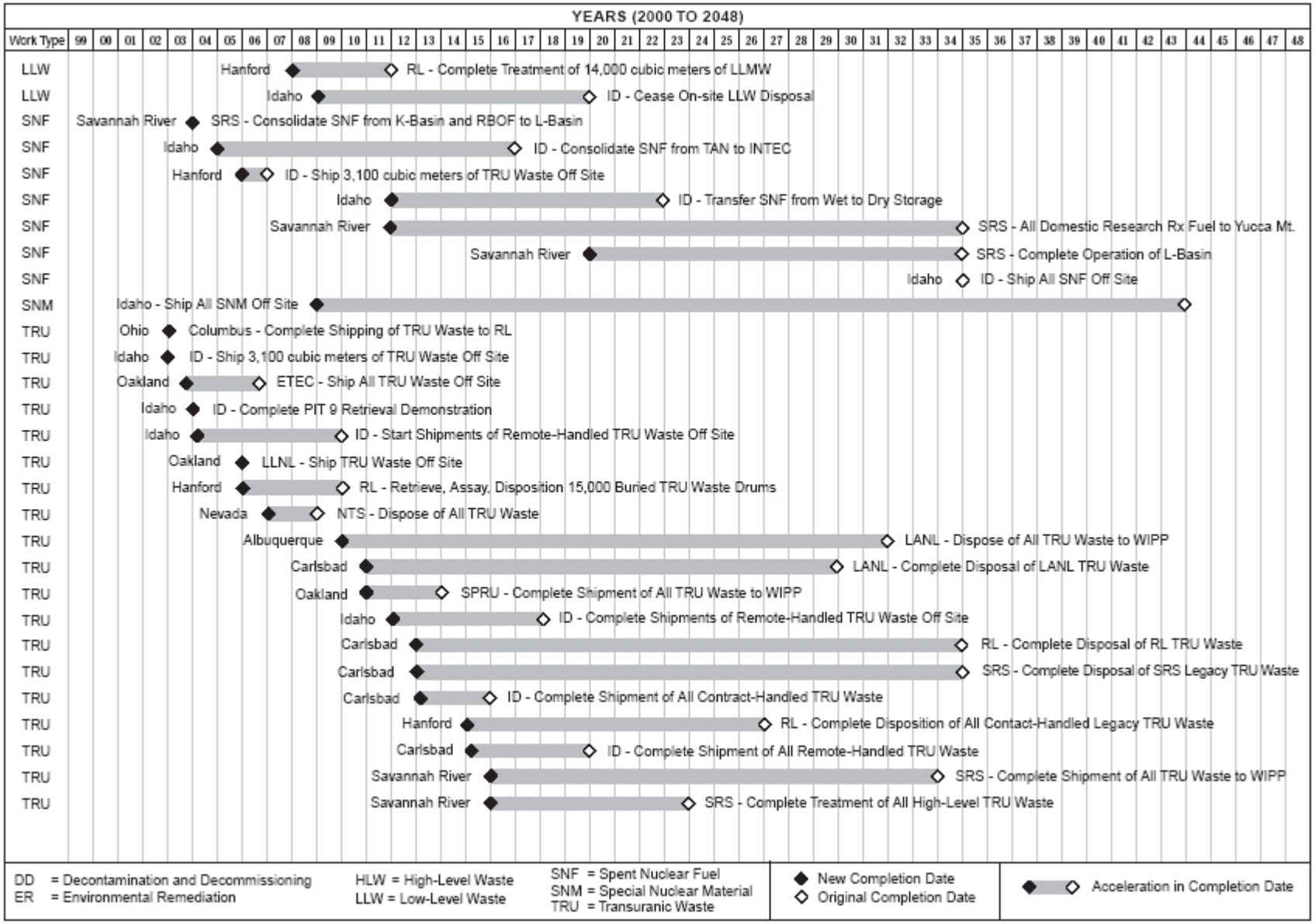


**Figure 3. Accelerated Risk Reduction Activities in Performance Management Plan**

In Stage 2, the process is fine-tuned using available risk assessment tools. For example, in setting priorities for tank closure, determining which tanks pose the greatest risk or whether tank closure should have a higher priority than D&D of a plutonium facility should be done on a site-specific basis.

While the end state for transfer of land or property is not fully defined and must result from agreements with state and EPA regulators, the material that must be stabilized and disposed of has been defined (see the appendix). Two Integrated Project Teams (IPTs) are working to establish a protocol for end-state determination; their work will be completed by October 2003.

The incorporation of lessons learned into ongoing projects was discussed earlier in Section 1.E.

## 3. Assessment of the Progress Made in Improving the Responsiveness and Effectiveness of the Environmental Management Program of the Department

The Top-to-Bottom Review Team characterized EM as lacking responsiveness and effectiveness after having discovered uncontrolled life-cycle cost and schedule growth within the cleanup program. At most EM sites, completion dates had continually been delayed, and the total life-cycle cost estimate for cleanup had increased by more than $10 billion in just 1 year. To reverse this trend, the team recommended that EM raise its standards of performance for up-front understanding and planning of work by applying project management principles to its core work areas.

The Assistant Secretary agreed with this recommendation and committed to restructuring EM's work planning processes. However, the Assistant Secretary's vision for improving EM's responsiveness and effectiveness includes more than applying project management principles; it also involves changing the way EM fundamentally thinks about work planning and work execution. In this context, the Assistant Secretary developed two major initiatives:

(a) Authorize ten EM corporate projects to accomplish the following strategic objectives:

  (a.1) Change how the Office of Environmental Management thinks about work planning and execution.

  (a.2) Identify motivated, capable federal employees for future leadership positions within the EM organization.

  (a.3) Respond to specific recommendations of the Top-to-Bottom Review Team.

(b) Restructure the EM organization.

*(a) Authorize Ten EM Corporate Projects to Accomplish the Following Strategic Objectives*

**(a.1) Change how the Office of Environmental Management thinks about work planning and execution.** The Top-to-Bottom Review Team identified unfocused and inconsistent work planning processes as the principal contributors to EM's uncontrolled cost and schedule growth. Throughout the EM headquarters and field organizations, little progress had been made in applying the expectations and standards of performance set forth in DOE's *Program and Project Management Order* (DOE Order 413.3), released in October 2000. Instances in which the Order was applied often resulted in rigorous, mechanical application of requirements with little tailoring to satisfy unique project needs.

The Assistant Secretary directed that each EM corporate project be managed in accordance with the project management principles contained within DOE Order 413.3. Each project manager was required to use this Order to develop a management strategy tailored to the project's unique needs. To do so, project managers had to read and understand the manual, and then formulate a responsive, tailored project management strategy.

The Assistant Secretary functioned as the acquisition executive for each project, so that each project manager reported directly to her on all project-related matters. This provided an important training opportunity to convey to each project manager the Secretary of Energy's vision for accelerated risk reduction.

**(a.2) Identify motivated, capable federal employees for future leadership positions within the EM organization.** The first attempt to change the way EM thinks about work planning and execution failed. Immediately after receiving the Top-to-Bottom Review Team's report, the Assistant Secretary called upon the senior members of her headquarters staff to review the report and develop a response to its observations and recommendations. After several meetings, day-long conferences, and team-building seminars, she concluded that the existing headquarters leadership organization was not capable of initiating change quickly enough to meet DOE's needs.

Consequently, the Assistant Secretary developed a plan to advertise throughout the EM headquarters and field organizations for leaders to manage special projects in response to the Top-to-Bottom Review. The objective of this organization-wide search was to locate motivated, capable EM employees who possessed an understanding of the Review Team's recommendations and had a vision for improving EM's performance.

In May 2002, the Assistant Secretary selected project managers to develop and execute projects in response to the Top-to-Bottom Review. Although each project is structured to respond to a specific Review Team recommendation, the following elements are common to all projects:

- **Project manager selection**—Project managers were selected from among EM federal staff who applied for the position of project manager for special projects. Selection was based on the candidates' understanding of the issues raised in the Top-to-Bottom Review Team's report, as well as their proposed conceptual approach for

implementing the team's recommendations. The Assistant Secretary selected each project manager.

- **Integrated Project Team (IPT)**—Each project manager identified needed technical competencies and, with the assistance of the Headquarters Office of Management and Information, solicited and selected project staff from the headquarters and field organizations.

- **Duty status**—Project managers and IPT members are dedicated to the EM corporate project until the project is completed. "Detail" personnel actions have been prepared and placed in their official personnel folders. The duty station location of the project managers does not change from their official duty station, nor does the duty station of team members. Project managers use innovative technologies for communications and daily operations of the IPT. Significant travel is expected to be necessary during the course of a project.

- **Senior DOE advisor**—Project mangers and their IPT members work with an assigned DOE senior manager who functions as a project advisor. These advisors, selected by the Assistant Secretary, are one of the EM management resources available to the project manager and the IPT members in structuring and executing their project.

- **Project structure**—The development of each project follows the project management principles set forth in DOE Order 413.3. The Order's project management elements are tailored to provide logic, clarity, and efficiency to each individual project. Each project progresses through a series of Critical Decisions (i.e., CD-0, CD-1, CD-2, CD-3, and CD-4), with the Assistant Secretary serving as the DOE acquisition executive, as noted above.

- **Charter**—Project managers and IPT members interact with headquarters and field staffs as necessary to respond to the recommendations of the Top-to-Bottom Review Team. A project charter is approved by the Assistant Secretary to empower each project team to conduct its work.

- **Project completion**—Each project will be completed by October 2003, but some follow-on work may be assigned to the project team.

**(a.3) Respond to Specific Recommendations of the Top-to-Bottom Review Team.** The Top-to-Bottom Review Team observed that EM has not been driven by a completion mindset. A number of corporate projects were formulated to identify, plan, and execute corrective actions to improve EM's performance in response to the Review Team's recommendations. As discussed above, each project is managed through a series of development phases and Critical Decisions in accordance with DOE Order 413.3, and each will be completed no later than October 2003. The following projects have been initiated to respond to the recommendations of the Top-to-Bottom Review Team:

- **Project Title:** "Getting More Performance from Performance-Based Contracts"
  **Objective:** Improve EM's contracting process to better identify cleanup objectives and more suitably reward contractors who achieve those objectives.

  **Accomplishments to Date:** This project team focused on developing alternative business models to address specific EM contracting and subcontracting situations. In a number of cases, project team members worked with field office personnel to implement new contracting approaches to deal with problems more effectively. Examples include overhauling the performance-based fee arrangement on the Fernald Closure Contract and issuing a competitive solicitation for a cleanup contract at the Columbus Closure Project. In addition, the project team drafted a Source Evaluation Board (SEB) guidebook that will provide needed direction to inexperienced SEB teams as EM aggressively pursues more efficient competitive procurement strategies. Finally, the project team engaged in numerous contract reviews, making recommendations for significant changes in EM contracting strategies and assisting in the implementation of those strategies.

- **Project Title:** "Managing Waste to Reduce Risk: Other Than SNF and HLW"
  **Objective:** Eliminate obstacles that hinder the efficient dispositioning of waste.

  **Accomplishments to Date:** The efforts of this project team resulted in multiple accomplishments. These accomplishments included eliminating redundant audits of analytical laboratories and LLMW treatment, storage, and disposal facilities by EM contractors through requiring that all such audits be conducted by EM's Consolidated Audit Program, resulting in significant schedule and cost savings to EM. The project team also required EM field elements to streamline their process for authorizing waste to be disposed off site through the use of a blanket exemption process. The streamlined process reduces the time between characterization and disposal by up to a year at some EM sites. Additionally, the project team identified a solution for the disposal of a great deal of high-activity LLMW that allows the waste to be processed compliantly through treatment and permits waste that is compliant with land disposal restrictions (LDR) to be disposed of at existing commercial LLMW disposal facilities.

- **Project Title:** "Managing Waste to Reduce Risk: Spent Nuclear Fuel"
  **Objective:** Eliminate obstacles and achieve more rapid reduction of SNF risks.

  **Accomplishments to Date:** This project team developed a conceptual design for a DOE-wide SNF disposition system, which integrates the programmatic baselines of multiple DOE sites and organizations to align SNF disposition priorities and schedules. This system design also integrates the HLW and SNF activities that must be coordinated with the Office of Civilian Radioactive Waste Management's geologic repository.

  Additionally, this project team developed a business- and risk-driven strategy to accelerate transfer of all EM-managed SNF to safe, interim dry storage and accelerate final disposition by nearly 10 years. This strategy focuses on minimizing

construction of additional storage facilities and optimizing investments in required packaging and treatment capabilities. The shipping plans supporting this strategy are identified in a draft delivery schedule that is capable of achieving final disposal of all EM-managed SNF (and HLW) by 2025, and supports the additional acceleration of EM site closures.

This project team also identified opportunities to reduce risk, cost, and schedule by avoiding unnecessary treatment and/or packaging activities. If implemented, these changes will avoid approximately 500 intersite shipments of SNF and HLW and reduce packaging operations by several years, saving $400 million in treatment costs.

- **Project Title:** "Managing Waste to Reduce Risk: High-Level Waste"
  **Objective:** Eliminate obstacles and achieve more rapid reduction of HLW risks.

  **Accomplishments to Date:** This project team concentrated its efforts on analysis of treatment for separated low-activity waste. This analysis resulted in the Office of River Protection documenting the life-cycle costs of different configurations from those it had been considering.

  Additionally, this project team confirmed one promising approach that the Hanford Site and the Savannah River Site had been investigating for increasing the amount of waste in each treated HLW disposal container. The project team determined that for the Savannah River Site, the maximum benefit to be achieved from increased waste loading would be attained through also accelerating processing of the tank waste salt stream that is to be separated into a low-activity fraction for on-site disposal and a high-activity fraction that is to be treated and placed in HLW disposal containers. A recommendation has been made to expedite the processing of the salt portion of tank waste, which, along with increased waste loading, would reduce the duration of the HLW program by 3 years, producing overall cost savings of approximately $1 billion. The HLW River Protection Project is in the process of identifying and eliminating unnecessary conservatism in DOE Order–mandated analyses for stabilized waste residues remaining in HLW management facilities.

- **Project Title:** "Safeguards and Security: Reducing the Threat at EM Sites"
  **Objective:** Develop nuclear material storage that optimizes safety and security.

  **Accomplishments to Date:** This project team developed and implemented an EM-wide policy for the disposition of EM excess nuclear materials. This policy focuses EM resources on the near-term disposition of these materials using existing EM assets, such as low-level burial grounds and WIPP. The policy also calls for the consolidation of nuclear materials that cannot be disposed in the near term. This consolidation enhances security and decreases cost by reducing the number of sites storing these materials. This policy and progress toward its implementation at EM sites have resulted in hundreds of kilograms of SNM being permanently disposed, thus reducing the risk posed by this material to the public and the environment. Also, EM has made progress in the consolidation of nuclear materials with the recent completion of removal of plutonium from Rocky Flats to the Savannah River Site.

- **Project Title:** "A Cleanup Program Driven by Risk-Based End States"
  **Objective:** Improve the planning and execution of closure site end states.

  **Accomplishments to Date:** On July 15, 2003, as a result of this project team's activities, the Deputy Secretary approved DOE Policy 455.1, *Use of Risk-based End States*. This policy describes DOE's new approach to cleanup—one that is focused on achieving a clearly defined, risk-based end state. Thirty-four DOE sites have initiated the development of end-state visions based on guidance developed by this project team. The team's guidance also specifies the creation of variance reports documenting the differences between the current site cleanup strategy and one that is risk-based. The policy and the work of the project team have already led to a rethinking of cleanup strategies at Fernald, Ashtabula, the Separation Process Research Unit, and Idaho National Engineering and Environmental Laboratory. Broader impact is expected as sites complete their end-state visions and DOE is able to fully implement DOE Policy 455.1.

- **Project Title:** "Integrated Program for Accelerated Cleanup of Small Sites"
  **Objective:** Provide consolidated management to accelerate closure of small sites.

  **Accomplishments to Date:** This project team visited each of EM's small closure sites and assessed the site's closure plan for opportunities for acceleration. The team discovered that many different interpretations of cleanup completion and site closure existed throughout the small sites and even within the EM headquarters organization. Some approved site closure plans did not include long-term operations of systems such as groundwater treatment units and landfill cap maintenance. In the absence of explicit programmatic end-state "requirements," EM was investing significant cleanup funds without having a clearly defined technical description of the site's end state. This lack of corporate consistency posed many challenges in defining exactly what work had to be done to achieve site closure.

  In response, this project team developed programmatic guidance to define critical points in the cleanup process, specify where EM's active cleanup responsibility ends, and clarify the responsibilities of other program secretarial offices managing a site after EM's cleanup mission has been completed. Accordingly, these definitions serve as the framework for revising strategic plans, site baselines, and implementation plans. The Assistant Secretary for Environmental Management issued this guidance to site managers in a separate memorandum, "Definition of Environmental Management Completion," dated February 12, 2003, as a program policy and cleanup reform.

- **Project Title:** "Focusing EM Program Resources on Cleanup"
  **Objective:** Eliminate activities that do not contribute to accelerated risk-based cleanup.

  **Accomplishments to Date:** This project team visited each EM field and headquarters organization to examine federal resource expenditures (the third-largest

program cost over the project life cycle) and the effectiveness of site business systems that identify, plan, and execute EM cleanup work. As of result of these evaluations, many adjustments to EM practices were recommended by the project team and approved by the Assistant Secretary. They include (1) eliminating use of EM funds to pay for work from other organizations, (2) preventing informal project work scope creep on contracts, (3) eliminating duplicative field and headquarters functions, and (4) eliminating remnants of former mission scope.

Additionally, this project team's reviews will become a routine institutional activity that will periodically review federal expenditures and EM headquarters business systems to improve project communication and connect field element contract commitments to headquarters actions.

The project team's activities have identified and documented cost savings or avoidances estimated to total well over $100 million, with the potential to reach over $1 billion for the EM project life cycle.

- **Project Title:** "EM Consolidated Business Center"
  **Objective:** Improve project performance at EM closure sites by capturing and sharing the closure project experience base.

  **Accomplishments to Date:** A detailed plan for migrating and transitioning business functions from Rocky Flats, the Ohio EM offices, the Carlsbad Field Office, and smaller EM sites to the Consolidated Business Center (CBC) has been prepared and coordinated within DOE. CBC position descriptions for 127 staff positions have been prepared and are being graded and classified, and a staff recruitment process has been initiated. A structured CBC site location analysis has been completed, with location options provided for consideration and down selection. Detailed budget and funding estimates, along with a return-on-investment analysis, have been prepared and are being factored into the outyear budget cycle.

- **Project Title:** "Packaging and Transportation to Support Accelerated Risk Reduction"
  **Objective:** Remove internal obstacles and improve the efficiency of packaging and transportation.

  **Accomplishments to Date:** This project will focus primarily on addressing transportation and packaging obstacles identified by the other corporate projects. Consequently, this project will lag behind all other projects. CD-0 (project initiation) is scheduled to occur in December 2003.

Because each project team consists of top-performing EM employees from throughout the organization, its experience and knowledge gained will provide significant benefits to EM. Additionally, this approach is consistent with the President's Management Agenda, which focuses on improving the management and performance of the Federal Government. Building a high-performing culture requires attracting and retaining talented people who deliver sustained excellence in performance. EM's future viability as an organization depends on the clear

demonstration of results in site cleanup and closure. Improving management efficiencies requires that organizations challenge, hold accountable, and reward top-performing employees. The EM corporate project initiative does just that.

*(b) Restructure the EM Organization*

The anticipated EM organizational restructuring will ensure that functions outlined in the report of the Top-to-Bottom Review Team will serve as the framework for the daily work activities of the EM staff. The creation of new organizational functions will focus on operations oversight (including Integrated Safety Management, safeguards and security, and emergency management); logistics and waste disposal (including federal and commercial disposal); environmental cleanup (including cleanup technologies, engineering, and licensing); organization performance management (including acquisition, performance evaluation, and strategic initiatives); and business management (including budget planning and controls, regulatory affairs, and business services). These functions will focus EM work in the areas identified as most critical to accelerated cleanup and closure.

## 4. Any Proposal for Legislation That the Secretary Considers Necessary to Carry out Such Initiatives, Including the Justification for Each Such Proposal

Once the Top-to-Bottom Review had been completed, there were several indications that legislative changes might be required so that the accelerated cleanup and closure program could proceed. At that time, however, DOE committed to proceeding within the existing legislative requirements and requesting changes only if necessary. Based on work by the IPTs and on difficulties encountered by managers providing program direction, DOE has either proposed or is supporting three legislative actions directly related to implementation of the accelerated cleanup and closure program. These three actions are described in the following subsections.

### 4.A Waste Characterization Requirements for Disposal of Transuranic Waste in the Waste Isolation Pilot Plant

Congress has proposed legislation that would streamline the characterization of TRU waste streams destined for disposal at WIPP. DOE is supportive of this legislation because it represents a risk-based approach that would accelerate the disposal of TRU waste. This approach would not require sampling and analysis for hazardous waste and would be consistent with requirements in The Waste Isolation Pilot Land Withdrawal Act (Public Law 102-579). In that act and after careful deliberation, Congress decided that because the waste is disposed deep underground, it does not have to be treated to meet LDR treatment standards that were designed for traditional shallow, near-surface disposal. With no treatment required, there is no need to perform intrusive sampling and analysis of the waste to determine the concentration of hazardous constituents. The proposed legislation states as follows:

> (a) Notwithstanding any other law, waste characterization and confirmation activities authorized pursuant to the Solid Waste Disposal Act, (42 U.S.C. 6901 et seq.), applicable to transuranic waste transported to, stored at, or disposed of at the Waste Isolation Pilot Plant (referred to in this section as "WIPP") are limited to—
>
> (1) confirmation, through the use of either radiography or visual examination of a statistically representative subpopulation of the waste stream to which the waste belongs, that the waste contains no ignitable, corrosive, or reactive waste; and
>
> (2) review of the Waste Stream Profile Form to verify that
>
> (A) the waste is not ignitable, corrosive, or reactive, and
>
> (B) any hazardous waste, constituent or characteristic regulated pursuant to the Solid Waste Disposal Act is acceptable for transport to, storage at, or disposal in the WIPP under any permit issued under the authority of the Solid Waste Disposal Act.

**4.B Definition of High-Level Waste**

A proposed amendment clarifies the definition of "high-level radioactive waste" contained in Section 2(12) of the Nuclear Waste Policy Act (NWPA) of 1982, 42 U.S.C. 10101(12), by stating explicitly that material resulting from reprocessing (as well as any material commingled or contaminated with it) is not HLW if the Secretary of Energy, in consultation with the NRC and after a period of time for public comment, determines that the material need not be permanently isolated by disposal in a deep geologic repository designed for the disposal of SNF to protect the public health and safety. The original 1982 definition implied but did not state that the Secretary, in consultation with the NRC, was authorized to determine on that basis which reprocessing wastes are sufficiently radioactive to require disposal in the repository as "high-level radioactive waste." Recently, however, it has been asserted that the definition actually somehow forecloses the Secretary from making these judgments, a result not intended when the NWPA was adopted. This assertion is contrary to the long-standing practice of DOE and the NRC, a practice begun by the Atomic Energy Commission.

In its current form, the NWPA's definition of HLW states: "The term high-level radioactive waste means (A) the highly radioactive material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations; and (B) other highly radioactive material that the Commission, consistent with existing law, determines by rule requires permanent isolation." The definition is currently silent on the process and standard for determining what waste from reprocessing qualifies as HLW under clause A. Accordingly, the amendment adds a clause to the definition spelling out the Secretary's authority to make these determinations in consultation with the NRC, as well as the standard to be applied in making them. The proposed amendment states:

> (a) Section 2(12) of the Nuclear Waste Policy Act of 1982 (42 U.S.C. 10101(12)) is amended by adding at the end thereof the following:

"High-level radioactive waste does not include radioactive materials resulting from the reprocessing of irradiated reactor fuel (including wastes commingled or contaminated with such materials) that the Secretary of Energy, in consultation with the Nuclear Regulatory Commission, determines do not require permanent isolation by disposal in a deep geologic repository designed for disposal of spent nuclear fuel and high-level radioactive waste in order to protect the public health and safety."

(b) Section 6(4) of the West Valley Demonstration Project Act (42 U.S.C. 2021a note) is amended by adding at the end thereof the following:

"High-level radioactive waste does not include radioactive materials resulting from the reprocessing of irradiated reactor fuel (including wastes commingled or contaminated with such materials) that the Secretary of Energy, in consultation with the Nuclear Regulatory Commission, determines do not require permanent isolation by disposal in a deep geologic repository designed for disposal of spent nuclear fuel and high-level radioactive waste in order to protect the public health and safety."

(c) Section 11dd. of the Atomic Energy Act of 1954 (42 U.S.C. 2014(dd)) is amended by inserting ", as amended" after "1982".

(d) For purposes of section 202 of the Energy Reorganization Act of 1974 (42 U.S.C. 5842), the term "high-level radioactive waste" means—

(1) spent nuclear fuel as that term is defined in section 2(23) of the Nuclear Waste Policy Act of 1982 (42 U.S.C. 10101(23)), and

(2) high-level radioactive waste as that term is defined in section 2(12) of the Nuclear Waste Policy Act of 1982 (42 U.S.C. 10101(12)).

**4.C Waste Materials in Silos at DOE's Fernald Facility**

The Fernald silo waste, like other materials regulated as 11e.(2) material, can be considered to be mill tailings. However, because the Fernald site was never licensed by the NRC or by an Agreement State under Section 274 of the Atomic Energy Act of 1954, as amended, the NRC has expressed concern that the Fernald silo waste does not fit its definition of byproduct material, and thus cannot be disposed of as 11e.(2) byproduct material at a licensed commercial facility. This legislation would resolve a gap in the complex regulatory regime governing low-activity wastes and permit timely disposal of the Fernald wastes in a licensed commercial disposal facility.

The proposed legislation states: WASTE MATERIAL IN SILOS AT DEPARTMENT OF ENERGY'S FERNALD FACILITY.

(a) Notwithstanding any other law, the material in the concrete silos at the Fernald uranium processing facility managed on the date of enactment of this section by the Department of Energy is considered "byproduct material" as defined by section 11e.(2) of the Atomic Energy Act of 1954 (42U.S.C.2014(e)(2)). The Department of Energy may dispose of the material in a facility regulated by the Nuclear Regulatory Commission or by an Agreement State.

(b) If the Department of Energy disposes of the material in such a facility, the Nuclear Regulatory Commission or the Agreement State shall regulate the material as 11e.(2) byproduct material under that Act. The material shall remain subject to the jurisdiction of the Department of Energy until it is received at a commercial facility licensed by the Nuclear Regulatory Commission or by an Agreement State, at which time the material shall be subject to the health and safety requirements of the Nuclear Regulatory Commission or the Agreement State with jurisdiction over the commercial facility.

# Appendix

Table A-1, "Corporate Performance Measures at the Office Level," specifies the progress in risk reduction committed to by each site for which EM has cleanup responsibility.

**Table A-1. Corporate Performance Measures at the Office Level**

| Operations/ Field Office | Performance Measure | Unit | Targets | | | Completed to Date (Pre-2003 Actuals) | Life-Cycle Scope |
|---|---|---|---|---|---|---|---|
| | | | FY03 | FY04 | FY05 | | |
| Albuquerque | TRU disposed | $m^3$ | 800 | 1,400 | 1400 | 300 | 9,200 |
| | LLW/LLMW disposed | $m^3$ | 59 | 35 | 35 | 7,212 | 7,341 |
| | Radioactive facility completions | facilities | | | | 1 | 2 |
| | Industrial facility completions | facilities | | | | 1 | 5 |
| | Geographic sites eliminated | sites | | | | 33 | 37 |
| | Remediation complete | sites | 24 | 44 | 81 | 1,724 | 2,832 |
| Carlsbad | Geographic sites eliminated | sites | | | | | 1 |
| Chicago | LLW/LLMW disposed | $m^3$ | | | | 537 | 537 |
| | Radioactive facility completions | facilities | | 1 | 6 | 66 | 88 |
| | Geographic sites eliminated | sites | | | | 7 | 9 |
| | Remediation complete | sites | | 4 | 8 | 574 | 586 |
| Idaho | eU packaged for disposition | containers | 52 | 313 | 34 | 205 | 1,029 |
| | DU & U packaged for disposition | MT | | | | | 0.04 |
| | Liquid waste eliminated | k-gallons | | | | | 900 |
| | Liquid waste tanks closed | tanks | 1 | 1 | 1 | | 11 |
| | HLW packaged for disposition | containers | | | | | 4,200 |
| | SNF packaged for disposition | MTHM | | | 0.073 | | 253 |
| | TRU disposed | $m^3$ | 623 | 7,615 | 7,864 | 2,866 | 66,139 |
| | LLW/LLMW disposed | $m^3$ | 4,450 | 8,540 | 5,240 | 22,485 | 98,550 |
| | MAAs eliminated | areas | | | | | 1 |
| | Nuclear facility completions | facilities | | | | 13 | 86 |
| | Radioactive facility completions | facilities | | 3 | 1 | 5 | 37 |
| | Industrial facility completions | facilities | 3 | 4 | 3 | 46 | 242 |
| | Geographic sites eliminated | sites | 1 | | | 3 | 6 |
| | Remediation complete | sites | 41 | 3 | 3 | 332 | 503 |

| Operations/ Field Office | Performance Measure | Unit | Targets | | | Completed to Date (Pre-2003 Actuals) | Life-Cycle Scope |
|---|---|---|---|---|---|---|---|
| | | | FY03 | FY04 | FY05 | | |
| Nevada | TRU disposed | $m^3$ | 18 | 198 | 197 | | 734 |
| | Geographic sites eliminated | sites | 1 | | 1 | 1 | 11 |
| | Remediation complete | sites | 46 | 46 | 48 | 675 | 2,082 |
| Ohio | DU & U packaged for disposition | MT | 0.006 | | | 0.002 | 0.008 |
| | Liquid waste tanks closed | tanks | | | | | 2 |
| | HLW packaged for disposition | containers | | | | 275 | 275 |
| | TRU disposed | $m^3$ | | | | | 692 |
| | LLW/LLMW disposed | $m^3$ | 2,662 | 15 | 500 | 12,496 | 34,995 |
| | Nuclear facility completions | facilities | | | 5 | | 9 |
| | Radioactive facility completions | facilities | 6 | 13 | 5 | 43 | 79 |
| | Industrial facility completions | facilities | 9 | 22 | 25 | 60 | 124 |
| | Geographic sites eliminated | sites | | | | 1 | 6 |
| | Remediation complete | sites | 11 | 3 | 38 | 107 | 190 |
| Oakland | SNF packaged for disposition | MTHM | | | | 1 | 1 |
| | TRU disposed | $m^3$ | 98 | 105 | | | 253 |
| | LLW/LLMW disposed | $m^3$ | 881 | 1,494 | 1,250 | 4,788 | 8,940 |
| | Nuclear facility completions | facilities | | | | | 4 |
| | Radioactive facility completions | facilities | | 1 | 2 | 3 | 6 |
| | Industrial facility completions | facilities | | 1 | 1 | 12 | 14 |
| | Geographic sites eliminated | sites | | | 1 | 2 | 10 |
| | Remediation complete | sites | 27 | 21 | 15 | 338 | 432 |
| Oak Ridge | eU packaged for disposition | containers | | | | | 673 |
| | DU & U packaged for disposition | MT | | | | | 56,988 |
| | TRU disposed | $m^3$ | | 250 | 178 | | 646 |
| | LLW/LLMW disposed | $m^3$ | 9,980 | 10,564 | 7,719 | 62,757 | 100,244 |
| | Nuclear facility completions | facilities | | | 7 | 2 | 28 |
| | Radioactive facility completions | facilities | | 5 | 12 | 6 | 48 |
| | Industrial facility completions | facilities | 7 | 17 | 27 | 79 | 172 |

| Operations/ Field Office | Performance Measure | Unit | Targets | | | Completed to Date (Pre-2003 Actuals) | Life-Cycle Scope |
|---|---|---|---|---|---|---|---|
| | | | FY03 | FY04 | FY05 | | |
| | Geographic sites eliminated | sites | | | | 28 | 29 |
| | Remediation complete | sites | 8 | 20 | 8 | 253 | 654 |
| Paducah | eU packaged for disposition | containers | | | | | 182 |
| | DU & U packaged for disposition | MT | | | | | 453,312 |
| | LLW/LLMW disposed | $m^3$ | 1,875 | 75 | 875 | 3,295 | 17,331 |
| | Radioactive facility completions | facilities | | | | | 2 |
| | Geographic sites eliminated | sites | | | | | 1 |
| | Remediation complete | sites | 1 | 1 | | 85 | 237 |
| Portsmouth | eU packaged for disposition | containers | | | | | 1,450 |
| | DU & U packaged for disposition | MT | | | | | 205,567 |
| | LLW/LLMW disposed | $m^3$ | 2,003 | 1,143 | 9,089 | 13,820 | 33,543 |
| | Geographic sites eliminated | sites | | | | | 1 |
| | Remediation complete | sites | 2 | | | 147 | 163 |
| Rocky Flats | Pu packaged for long-term disposition | containers | 716 | | | 984 | 1,700 |
| | Pu/U residues packaged for disposition | kg bulk | | | | 103,901 | 103,901 |
| | TRU disposed | $m^3$ | 2,065 | 2,344 | 2,096 | 4,259 | 12,355 |
| | LLW/LLMW disposed | $m^3$ | 39,788 | 53,882 | 68,120 | 76,704 | 254,962 |
| | MAAs eliminated | areas | | 1 | | 6 | 7 |
| | Nuclear facility completions | facilities | | 1 | 2 | 1 | 6 |
| | Radioactive facility completions | facilities | | 14 | 36 | | 54 |
| | Industrial facility completions | facilities | 6 | 40 | 113 | 151 | 317 |
| | Geographic sites eliminated | sites | | | | | 1 |
| | Remediation complete | sites | 9 | 8 | 30 | 177 | 240 |

| Operations/ Field Office | Performance Measure | Unit | Targets | | | Completed to Date (Pre-2003 Actuals) | Life-Cycle Scope |
|---|---|---|---|---|---|---|---|
| | | | FY03 | FY04 | FY05 | | |
| Richland | Pu packaged for long-term disposition | containers | 2,000 | 900 | | 500 | 3,400 |
| | eU packaged for disposition | containers | | | | 1,648 | 2,958 |
| | Pu/U residues packaged for disposition | kg bulk | 895 | 176 | | 2,396 | 3,467 |
| | DU & U packaged for disposition | MT | | | | 3,100 | 3,100 |
| | SNF packaged for disposition | MTHM | 855 | 632 | 0.800 | 638 | 2,131 |
| | TRU disposed | $m^3$ | 78 | 200 | 983 | 99 | 28,369 |
| | LLW/LLMW disposed | $m^3$ | 2,320 | 3,323 | 3,875 | 32,848 | 69,391 |
| | MAAs eliminated | areas | | | 1 | | 2 |
| | Nuclear facility completions | facilities | 2 | 2 | | 1 | 172 |
| | Radioactive facility completions | facilities | 1 | 2 | 3 | | 415 |
| | Industrial facility completions | facilities | 3 | 3 | 13 | 161 | 855 |
| | Geographic sites eliminated | sites | | | | | 1 |
| | Remediation complete | sites | 32 | 37 | 49 | 230 | 1,618 |
| Office of River Protection | Liquid waste eliminated | k-gallons | | | | | 54,000 |
| | Liquid waste tanks closed | tanks | | 6 | 8 | | 177 |
| | HLW packaged for disposition | containers | | | | | 9,200 |
| | TRU disposed | $m^3$ | | | 120 | | 7,600 |
| | LLW/LLMW disposed | $m^3$ | | | | | 310,000 |
| | Nuclear facility completions | facilities | | | | | 18 |
| | Radioactive facility completions | facilities | | | | | 28 |
| | Industrial facility completions | facilities | | | | | 102 |
| | Remediation complete | sites | | | | 5 | 322 |

| Operations/ Field Office | Performance Measure | Unit | Targets | | | Completed to Date (Pre-2003 Actuals) | Life-Cycle Scope |
|---|---|---|---|---|---|---|---|
| | | | FY03 | FY04 | FY05 | | |
| Savannah River Site | Pu packaged for long-term disposition | containers | 120 | 423 | 165 | | 750 |
| | eU packaged for disposition | containers | 225 | 612 | 635 | | 2,809 |
| | Pu/U residues packaged for disposition | kg bulk | 39 | 78 | 76 | 222 | 414 |
| | DU & U packaged for disposition | MT | 1,815 | | | | 23,182 |
| | Liquid waste eliminated | k-gallons | 700 | 1,300 | 1,900 | | 33,100 |
| | Liquid waste tanks closed | tanks | | 2 | | 2 | 51 |
| | HLW packaged for disposition | containers | 130 | 250 | 250 | 1,337 | 5,060 |
| | SNF packaged for disposition | MTHM | 1.567 | 1.254 | | | 36 |
| | TRU disposed | $m^3$ | 840 | 840 | 840 | 196 | 15,326 |
| | LLW/LLMW disposed | $m^3$ | 11,012 | 10,744 | 10,364 | 47,264 | 219,526 |
| | MAAs eliminated | areas | | | | | 4 |
| | Nuclear facility completions | facilities | | 2 | | | 200 |
| | Radioactive facility completions | facilities | | 6 | 2 | | 45 |
| | Industrial facility completions | facilities | 21 | 23 | 5 | | 592 |
| | Geographic sites eliminated | sites | | | | | 1 |
| | Remediation complete | sites | 13 | 13 | 3 | 281 | 515 |

# Glossary of Acronyms

| | |
|---|---|
| **AEA** | Atomic Energy Act |
| **CBA** | collective bargaining agreement |
| **CD** | Critical Decision |
| **CERCLA** | Comprehensive Environmental Response, Compensation, and Liability Act |
| **CFA** | Central Facilities Area |
| **CFR** | Code of Federal Regulations |
| **CH-TRU** | contact-handled transuranic waste |
| **Ci** | Curie |
| **CMAC** | Contract Management Advisory Council |
| **Cs/Sr** | cesium/strontium |
| **D&D** | decontamination and decommissioning |
| **DOE** | Department of Energy |
| **DU** | depleted uranium |
| **DU & U** | depleted uranium and uranium |
| **EM** | Environmental Management |
| **EPA** | Environmental Protection Agency |
| **ER** | environmental remediation |
| **ETEC** | Energy Technology Engineering Center |
| **ETTP** | East Tennessee Technology Park |
| **eU** | enriched uranium |
| **FY** | fiscal year |
| **GFSI** | government-furnished services and items |
| **GTCC** | greater than class C |
| **HFBR** | High Flux Beam Reactor |
| **HFIR** | High Flux Isotope Reactor |
| **HLW** | high-level waste |
| **HMO** | health maintenance organization |
| **ID** | Idaho |
| **INEEL** | Idaho National Engineering and Environmental Laboratory |
| **INTEC** | Idaho Nuclear Technology and Engineering Laboratory |
| **IPT** | Integrated Project Team |
| **kg** | kilogram |
| **LANL** | Los Alamos National Laboratory |
| **LLMW** | low-level mixed waste |
| **LLNL** | Lawrence Livermore National Laboratory |
| **LLW** | low-level waste |
| **$m^3$** | cubic meters |
| **M&O** | management and operating |
| **MAA** | material accessibility area |

| | |
|---|---|
| **MT** | metric tons |
| **MTHM** | metric tons of heavy metal |
| **Na** | sodium |
| **NEPA** | National Environmental Policy Act |
| **NGA** | National Governors Association |
| **NRC** | Nuclear Regulatory Commission |
| **NTS** | Nevada Test Site |
| **NWPA** | Nuclear Waste Policy Act |
| **ORP** | Office of River Protection |
| **OSRP** | Offsite Storage Recovery Program |
| **PBF** | Power Burst Facility |
| **PBI** | performance-based incentive |
| **PFP** | Plutonium Finishing Plant |
| **PMP** | Performance Management Plan |
| **PO** | Portsmouth |
| **Pu** | plutonium |
| **Pu/U** | plutonium/uranium |
| **RBOF** | Receiving Basin for Offsite Fuel |
| **RCRA** | Resource Conservation and Recovery Act |
| **RFP** | Request for Proposals |
| **RH-TRU** | remote-handled transuranic (waste) |
| **RL** | Richland |
| **RMHF** | Radioactive Material Handling Facility |
| **ROD** | Record of Decision |
| **RTG** | Radioisotope Thermoelectric Generator |
| **RW** | Office of Civilian Radioactive Waste Management |
| **SAC** | Safety Assessment Center |
| **SNF** | spent nuclear fuel |
| **SNM** | special nuclear material |
| **SPRU** | Separations Process Research Unit |
| **SQS** | small-quantity site |
| **SRS** | Savannah River Site |
| **SST** | single-shell tank |
| **TAN** | Test Area North |
| **TRA** | Test Reactor Area |
| **TRU** | transuranic (waste) |
| **U** | uranium |
| **UMTRCA** | Uranium Mill Tailings Radiation Control Act |
| **VOC** | volatile organic compounds |
| **WGA** | Western Governors Association |
| **WIPP** | Waste Isolation Pilot Plant |