

Session 17

Panel: Application of Complex-Wide Lessons Learned In Planning and Executing Future US Department Of Energy Cleanups

Panel Reporter - Kirste Webb, Tetra Tech

This panel discussion focused on Government and contractor lessons learned in baseline acceleration techniques, safety and security, and waste management, building on the US DOE Oak Ridge Operations Environmental Management Lessons Learned Workshop held in January 2006. At that time, the US Department of Energy Oak Ridge Operations Environmental Management Program (DOE ORO EM) in conjunction with the Energy, Technology and Environmental Business Association (ETEBA) held a lessons learned workshop in Oak Ridge, Tennessee. The purpose of the workshop was to focus attention on lessons learned in a range of topics important to site cleanup success at DOE sites, including procurement, waste management, safety, security, and baseline acceleration techniques. Steve McCracken, Assistant Manager for EM at ORO, told workshop participants that the process of focusing on lessons learned from other DOE sites was as important as the product or output of the workshop itself.

In preparation for the workshop, 21 companies, in an almost even mix of large and small, submitted over 50 lessons learned from nine DOE sites across the complex. Companies were then invited to send representatives to the workshop -- participants who could discuss their experiences, both positive and negative, that produced the lessons learned. Working in facilitated category breakout sessions, participants spent several hours sharing lessons learned in their category. Large and small business representatives participated in the same breakout sessions while DOE held a separate session and discussed each category. Participants developed a list of their most significant lessons learned.

In his opening remarks Mr. Boyd reported that “The workshop produced dozens of well-constructed recommendations that we will incorporate into our program as we move forward into a next phase of environmental cleanup on the Oak Ridge Reservation -- the cleanup of the central campus of Oak Ridge National Laboratory and the central valley of the Y-12 National Security Complex. How can we improve our performance and work safer when we enter the new phase of cleanup and closure? We believe in learning from past successes as well as mistakes, and our lessons learned workshop helped us bring them to the forefront. The Oak Ridge EM program is focused on doing the job right the first time. The workshop was a creative and useful way to help us along that path.”

This Panel Session was designed to maintain the momentum gained in that workshop at Oak Ridge just over a year ago, and to share further lessons learned among our colleagues across the DOE complex and beyond. The following presenters were involved:

1. Baseline Acceleration Techniques:
 - a. Frazer Lockhart, Manager, DOE Rocky Flats

- b. Dennis Nixon, Project Director and formerly Fernald Closure Director, Fluor Corporation
2. Safety and Security:
 - a. Gerald Boyd, Manager, DOE-Oak Ridge Operations
 - b. Steve Henry, ESH&Q Manager, Los Alamos National Laboratory (LANL)
 - c. Dr. Larry Brede, Senior Vice President for DOE Programs, Wackenhut Services, Inc.
3. Waste Management
 - a. Beth Sellers, Manager, DOE Idaho Operations
 - b. Dave Swale, Vice President, EnergySolutions, Savannah River
 - c. Glenn Henderson, Project Manager, ECC/E2 Closure Services, Columbus Closure Project

Baseline Acceleration – Rocky Flats, Frazer Lockhart

Frazer Lockhart, Manager, DOE Rocky Flats opened the discussion with an overview of some of the lessons learned from the accelerated cleanup at Rocky Flats, a project that was completed several months ahead of schedule and hundreds of millions of dollars under budget. One of the primary lessons learned for Rocky Flats was that the contract basis has to be solid. In the case of Rocky Flats, the contract type was Cost Plus Incentive Fee (CPIF), which offered strong incentives, and also pushed for the best-in-class, in companies, as well as in people. A second lesson learned, which was part of the contract type was DOE-HQ support for the terms and conditions included in the contract. The terms were aggressive, particularly on cost and fee. In addition, they allowed for provisions for acceleration, including very specific clauses in Sections B and H. The final condition in the RFP was for a comprehensive Project Controls System (PCS).

During project execution, DOE Rocky Flats learned that for baseline acceleration to be successful, DOE had to manage the contract, not the contractor. In order to accomplish this, there needed to be very clear requirements and expectations tied to specific and objective measures/milestones. It also meant that they would have to manage configuration control and not allow for unfunded mandates, and they would need to limit unofficial direction. The success at Rocky Flats stemmed from this, and DOE's expectation for outstanding and safe performance. DOE tied the contractor to very specific performance measures, with safety as the top priority. In return, DOE had to manage some internal activities, including ensuring the timely availability of Government-Furnished Services (GFS).

A third component in the successful acceleration at Rocky Flats was the management of risk and uncertainty. To manage this, the contractor and DOE identified and quantified the uncertainties associated with the project's endpoints, allocating the appropriate risk level to each. These uncertainties included:

- Final cleanup levels – working with the regulators to clarify the cleanup levels at completion
- Extent of contamination – the possibility for increased contamination above what was planned
- Receiver sites – ensuring that the appropriate sites were identified and available to accept the waste

- Approach for D&D – ensuring that the approach for D&D maximized the waste disposal options and minimized the amount of waste disposed of

The PCS requirements identified the use of an industry-standard earned value measurement system (EVMS) that was tailored to the specifics of the Rocky Flats project. This provided a single data system from which to pull data, ensuring that the data was consistent, accurate, and real-time, thus eliminating the need for multiple reports. It also incorporated a proven change control process with very high thresholds. The system encouraged the use of “what if:” scenarios to identify multiple plans for the various tasks.

Finally, DOE Rocky Flats managed to the baseline, which focused on not just the critical path alone, but also the secondary and near-critical items that could directly impact the critical path. As Mr. Lockhart stated, they “lived or died by the baseline.” DOE leveraged their baseline, identifying any variances, analyzing the basis for them and implementing corrective actions.

As noted previously, Mr. Lockhart noted that another key to success was DOE’s own changes in how it managed. They too must use the systems and procedures specified for the contractor. They needed to support the contractor and act on information as it was presented to them – deliver on commitments internally as well as externally. Communication was critical – “more discussion, less direction.”

In closing on the Rocky Flats lessons learned for baseline acceleration, Mr. Lockhart summarized them in four key areas:

1. Start with the contract – ensure that the appropriate contract type is in place
2. Understand the project and allocate the appropriate risk
3. People are as important as systems – that is behaviors and actions are just as important as project controls
4. DOE oversight must be demanding but fair in its management expectations, including leadership, overall project management, and safety

Baseline Acceleration – Fernald, Dennis Nixon

Similar to Rocky Flats, the Fernald Closure Project was completed ahead of schedule and under budget. It is now being transitioned to a nature park – “weapons to wetlands.” The success of this project stemmed from several lessons learned to ensure the acceleration of closure.

The foundation for their success was safety. Without a focus on safety, the site would not have completed closure. To achieve this, DOE and the contractor implemented the use of a scorecard system to monitor safety performance across the site.

Other lessons learned included fundamental activities:

- Incentive-based contract, with a fee that focuses the contractor on performance
- Focus on the baseline – make it as aggressive as possible
- Align with the customer and the stakeholders – communication is critical
- Demonstrate commitment to safety

In addition, they implemented a single execution plan, instead of multiple task plans. This plan was driven down to the lowest level feasible and was used to manage all of the project's activities through completion. Included in the plan was a resource-loaded schedule, tracked not by labor category, but by individual. As a result, they were able to predict, and thus communicate, each individual's end date so that all employees knew when their scope was completed.

To achieve acceleration, one technique that Fernald used was to plan more work than the funds available each fiscal year. This encouraged the contractor to be innovative and find ways to complete more work. However, it also included flexibility such that if the funds could not be made available, then scopes could be shifted to be completed at later dates but not impact the final end point.

Fernald also used a war room setting to have one location open to all project participants. Current cost and schedule data and key metrics were posted for all to review. This ensured an open communication channel with the employees as well as with the client. The contractor also encouraged its senior management to be in the field as often as possible. This showed the employee's management's commitment to safety as well as acceleration.

The final area of focus for Fernald was the employees. Workers were involved in the planning of all tasks, as well as in issue identification and resolution. To encourage commitment to the project, employees had the opportunity to share the fee that the contractor earned. In addition, employees were incentivized for safe performance. And, as noted previously, the contractor identified each employee's end date in advance. As end dates approached, the contractor provided assistance to employees to find jobs elsewhere.

Baseline Acceleration – Questions to the Panel

An audience member's observation was that DOE did not seem to know about other sites' lessons learned or perhaps was resistant to implementing these lessons learned because they did not apply. How could this be improved?

- Frazer Lockhart: It is true that some lessons learned may not apply to all sites, because circumstances may appear to be unique. The challenge was to illustrate better how these lessons learned could be applied. The best approach is to focus on what Mr. Lockhart termed "the first principles in project management." The basic approach to project and personnel management applies regardless of the site or the scope.
- Dennis Nixon – Fernald does document lessons learned; however, they realize that they had no formal system for sharing or tracking implementation. He suggested that perhaps there should be a more formal approach to obtaining and implementing such lessons learned across the DOE complex.

What were some of the key decisions/changes that allowed for activities to begin moving at Rocky Flats?

- Frazer Lockhart – DOE took the stance, and communicated it clearly, in the new contract that the site was going to close. They did this through the type of contract they issued, as well as by selecting a contractor with experience in environmental management, versus operations. In addition, they ensured that

all parties had the right end game focus – again, the site was going to close. The other change was to establish very clear expectations, incorporate these into a very disciplined project control system, and not only use them, but stick to them.

At Fernald, by informing employees of their end dates, did you see an increase in the frequency of worker compensation claims?

- Dennis Nixon – No – in fact, employees were very responsive to the contractor's openness. This encouraged employees and they wanted to be part of the winning team that achieved site closure.

At Fernald, you indicated that you had an aggressive, but reasonable schedule. You successfully finished ahead of schedule and under budget. Was the schedule truly aggressive?

- Dennis Nixon – Yes it was. The contractor was incentivized to accelerate closure, thus the schedule needed to be aggressive. As noted previously, we planned for more work than the funding available. This forced us to identify innovations to accomplish the additional scope. In addition, we were held accountable to the baseline. We had to anticipate that activities might get behind, but we had plans in place and the resources identified to handle such issues.

Safety and Security – Oak Ridge, Gerald Boyd

Safety and security at Oak Ridge is critical. It is a site that has portions going through cleanup and closure, in the midst of operations in support of science and defense activities. For example, at the East Tennessee Technology Park (ETTP), several facilities have been transferred to private sector, while others are in the process of being cleaned up for transfer, or demolished. The tenants at ETTP include contractors, unions, security forces, as well as private sector employers. To ensure the safety and security of everyone at this site, DOE requires a coordinated and integrated effort among all the parties. Emergency Response is just one example where coordination is critical. Because there had been little coordination among the tenants originally, each entity tended to use different types of respirators, not all of which were appropriate for some of the potential incidents. DOE and its contractors worked with all of the tenants and successfully identified appropriate respirators for all to use.

At the Oak Ridge National Laboratory (ORNL) and Y-12, DOE has ongoing operations, renovation and new construction, while trying to also clean up the legacy materials at the site, in some highly contaminated facilities. Similar to ETTP, integration of all of the tenants will be critical to ensure that operations are not impacted while cleanup and closure activities are taking place in near-by facilities.

A few of the key lessons learned specific to safety and security include:

- Human performance – involve the workers and other stakeholders early in the planning process
- Include specialists when laying out the plans for cleanup – e.g., security specialists to identify potential methods for minimizing the need for extensive use of security forces

- Knowledge of how to respond – ensure that all tenants and respondents understand the aspects of each site and how to respond to varying situations
- Plan for response – layout a plan for how to evacuate the various facilities, as well as how to respond to the potential alarms
- Continue transfer of infrastructure – work to transfer infrastructure as quickly as possible to minimize operational impacts

Safety and Security – Los Alamos National Laboratory (LANL), Steve Henry

At LANL, when the new contractor took over 6 months ago, the contractor identified a trend in safety incidents – the majority of the accidents were industrial accidents during task execution. The new contractor is a group of companies with experience from around the complex. As such, they brought their lessons learned to LANL to identify the root cause for these accidents and implement corrective action to minimize and eliminate them.

At transition, the new contractor senior management performed frequent walkdowns of the projects. They talked with workforce about some of their issues and concerns and working together were able to identify pre-existing conditions and issues. What they learned in these walkdowns was that the safety issues stemmed from:

- Lock-Out/Tag-Out (LO/TO) issues
- Gaps in the flow-down of requirements to subcontractors
- Ability to apply lessons learned
- Involvement of management and the workers

To help address these issues, the new contractor implemented several mechanisms for communication:

- Facility Safety Operations Committee – reviews all high and medium risk work to be accomplished
- Environmental Restoration Safety Meetings – weekly meetings with management of what is being planned next and an opportunity to discuss the hazard controls that will be put in place
- Local Safety Improvement Teams – at the project level, and include workers and supervisors to identify and resolve safety issues
- Weekly Safety Meetings – management, supervisors, and workers involved in a 30-minute “stop work” meeting to ensure that all are focused on safety first
- Tailgate meetings – at the start of each work day
- Monthly Lab Review Board – reviews all injuries and analyzes the root causes for corrective actions

In addition, the contractor has implemented several specific training programs:

- Use of mockups – for the higher risk projects, the contractor is using mockups of the project before actual execution. This provides workers an opportunity to test the process and equipment first and understand some of the issues that could be encountered.

- Behavior-based training – provides training specifically on behaviors that affect safety and can lead to unsafe activities, and how to change those behaviors.

A new technique the contractor is using is what they term “safety shorts.” These are in a variety of forms such as videos, fliers, or tool box items. They provide a very specific focus on current safety issues either at the site or lessons learned from other sites as appropriate. They are used in many of the meetings identified earlier, but mostly used in the 30-minute “stop work” meeting as a focus item.

The result of these activities is a significant reduction in injuries resulting during work execution. However, now they are focusing on workplace injuries, such as slips, trips, and falls. They are continuing to focus changing the culture and attitudes of safety.

Safety and Security – Hanford, Tony Umek

The primary focus for Hanford has been consistency and balance – that is, balancing risk with closure. To achieve this, they have implemented several lessons learned:

- Trend analysis – what gets measured gets done
- Systems Engineer Qualifications Program and implementation of a “Notebook” program
- Walkdowns
- Assessments
- Partnering with the client
- Single database for vital safety systems

The Systems Engineer Qualifications Program has proven to be a very good technique at Hanford. For each safety system, the contractor is creating a “notebook,” a cookbook for the systems engineer to understand all aspects of the safety system. Not only do the systems engineers use this notebook, it is used to communicate with the workers to help them better understand how to maintain the systems and ensure they are operated compliantly.

The assessments include both independent and self assessments. Hanford has a formal process in place for assessing the safety systems, including ranking the system in terms of its condition, age, date of last assessment, and any changed environmental conditions. The independent assessment includes expert teams that have an independent reporting chain of command.

To summarize for Hanford safety and security, the following are the key lessons learned:

- Understand the requirements of the project and the systems
- Work closely with the customer
- Assess the project through self and independent assessments and set the criteria for performing these
- Develop tools to support the workers, such as the Systems Engineer Notebook

Safety and Security – Multiple DOE Sites, Dr. Larry Brede

Wackenhut is responsible for security services at several DOE sites, including Rocky Flats, Oak Ridge, Savannah River and Nevada Test Site. Similar to all other lessons learned, those specifically related to security also follow the basic principles of project management.

For example, Wackenhut recommends including security in the initial planning. This assists with implementing solution-oriented compliant activities, as well as more effective use of the resources. As part of this, it is critical to prepare a security plan, which is a living document throughout the life of the project. As project conditions change and cleanup is completed, the document is modified to reflect the changes in security requirements.

A second lesson learned is to consolidate the special nuclear materials. At the sites where they are implementing this, it has proven to reduce the security areas, thus minimizing the need for additional security resources. It also allows remediation to continue with fewer constraints. Along with consolidation, establishing haul roads helps to reduce the security requirements. It allows the contractor to control access and takes the shipments out of any normal traffic flow.

As the cleanup progresses, security is involved in facility abandonment walkdowns. This ensures that there is no remaining classified material in the facility, and that no more hazards exist.

Through all of this, communication is a key driver – communication with management as well as bargaining unit personnel. To achieve success in security, it is critical to involve the bargaining unit leadership involved early. Similar to Fernald, security employment can be tied to key milestones, allowing individuals to know in advance when their services will be completed.

It comes down to people as the lesson learned – managing people to ensure success. At all of the sites, lunch-and-learn sessions are held with the security forces to share progress and lessons learned. In addition, offering outplacement support as security requirements are reduced has incentivized workers to continue performing strongly. To share these lessons, senior management is often placed at other sites.

Safety and Security – Questions

How do you encourage sharing across the sites?

- Steve Henry – at LANL, we brought in personnel from other sites that brought with them methods and processes that they have implemented successfully, along with lessons that they learned. We also plan on sending many of our personnel to other sites to gather data and lessons that can be implemented at LANL.
- Tony Umek – one good way is through EFCOG, which has a working group on integrated safety management. In addition, DOE does have a lessons learned process for gathering data; however, this could be improved upon for sharing and implementing across the complex. What it comes down to is human performance and engaging the workforce.
- Gerald Boyd – In addition to EFCOG, DOE ORO in conjunction with ETEBA has implemented a Quarterly Safety Forum which taps the lessons

learned from all of the ORO contractors. In addition, DOE (Pat Worthington) has implemented a DOE/Contractor Safety Council.

How do you keep security costs down when performing D&D work in areas requiring clearances?

- Dr. Larry Brede – one effective way, used at Rocky Flats and other sites, is to use retired personnel who have current clearances, rather than the security forces.

What are some of the challenges LANL faces regarding transportation, especially with the narrow transportation corridors?

- Steve Henry – The concept of the dedicated haul roads is a great idea; however, space is limited at LANL and this would not be easily implemented. Instead, LANL is looking at effective modifications to the shipping containers, changing facility designations and consolidating materials closer to their final destination.

Waste Management – Idaho Operations, Beth Sellers

Idaho took many of the lessons learned from the Rocky Flats project and incorporated them into the Idaho Cleanup Project (ICP) acquisition and contract. This included clearly defined end states and restructuring how DOE does business. To look at some of the lessons learned, some of the site's major projects can be highlighted:

- High-level waste tanks – Idaho was the first site to grout three HLW tanks. This was due in part to effective communication among all parties involved.
- CH-TRU and RH-TRU – Idaho is the #1 site for disposing of CH-TRU at WIPP and is the first site to transport RH-TRU to WIPP. To achieve this, the site had to work through the transportation safety issues and ensure that the measures and controls are implemented.
- Advanced Mixed Waste Treatment Project (AMWTP) – this is now a solid operating facility. However, it did not achieve this immediately. The shakedown issues prior to start-up took longer than anticipated. As a result, the site was going to miss a Settlement Agreement milestone. To minimize the impact from this, the site was proactive in communicating with the regulators the reason for the delay, a year in advance of the milestone date, and subsequently keeping them informed of the progress. A second issue was mis-certification of a drum to be disposed of at WIPP. The site had been proactive in certification techniques and had a second review done at WIPP. The WIPP review caught the issue and successfully stopped the transport of the drum prior to leaving the site.
- Waste shipment to Envirocare – the site inadvertently sent TRU waste to Envirocare. As a secondary check, Envirocare reviewed the data on the drum, prior to disposal in the cell. It found the error prior to disposal and was able to ship the drum back to Idaho for repackaging. As a result of this, Idaho changed its procedures for its tracking system and method for data interpretation.
- Buried waste – Idaho has prepared a detailed hazards analysis on the type of waste that might be buried. As a result, when a fire occurred during excavation, the site was prepared to respond. However, in an analysis of the method for response, the site recognized that the method would not apply to

all incidents, and thus revised the method to develop a new way that would apply to all incidents.

- Spent fuel basin sludge removal – this is a good example of drawing from lessons learned at other sites. DOE’s ORPS system had a report from Hanford, performing a similar activity. During this process, Hanford discovered potential for the generation of hydrogen. This information allowed Idaho to stop the work before any problems occurred and implement preventive action.
- Pit 9 – the primary lesson learned here is to ensure that the contractor thoroughly understands the requirements of the project.

Other action that Idaho has found beneficial, similar to other sites, is open communication and cooperation with all parties. For example, the site has many areas that are considered tribal sacred grounds. Thus, when work is commencing on or near any of these sites, DOE must coordinate with the tribes to ensure that the grounds are not impacted in any way. In addition, Idaho must coordinate with other stakeholders such as the Department of Defense. Idaho is home to the Naval Reactors Facility and some of the operations occur near this facility. The site is also coordinating with Savannah River to ship aluminum-cad fuel from Idaho to Savannah River. Idaho is also looking to expand the scope of AMWTP to accept waste from other states for treatment. In order to achieve this, though, Idaho must break down many of the barriers that exist with the states through which waste might cross.

As it relates to accelerated completion, Ms. Sellers offered the following lessons learned:

- Drive innovation
- Infuse experienced people
- Characterize materials early and incorporate this into the risk mitigation strategy
- Have strong project management
- Bring vendors in to understand how they fit into the operations

Ms. Sellers closed with “safety and progress go hand-in-hand.”

Waste Management – Savannah River Site, Dave Swale

At Savannah River Site, the lessons learned in waste management can be categorized into the different waste streams:

- Low-level waste (LLW) and low-level mixed waste (LLMW)
- Transuranic (TRU) waste

For LLW/LLMW, SRS uses a performance assessment approach to managing the waste. This drives them to a range of disposal options, not just one, thus offering a more cost-effective solution. In addition, they are re-characterizing some of the legacy waste and challenging the original waste codes. This has allowed them to reclassify some of the waste as LLW and thus go a different disposal route. To support this, they are using field assay to get more accurate data.

For the TRU waste, SRS has changed its shipping configuration. The primary shipping mechanism had been a 10-pack shipping configuration. SRS has found a way to package in a 14-pack, thus maximizing the amount of waste shipped in one shipment. As with LLW, SRS is also identifying alternative waste disposal options.

TRU waste remediation activities is another area that SRS has identified several lessons learned. The primary focus is on ensuring that the Authorization Basis (AB) is as flexible as possible. They are working to develop a standardized AB approach for handling TRU waste, thus ensuring that operations are consistent and achieving schedule and cost savings.

Waste Management – Columbus Closure Project, Glenn Henderson

This project entailed more than 3,000 regulated shipments for disposal with zero lost time accidents and zero transportation incidents. Many lessons learned were developed, especially in methods for handling significantly increased waste volumes. They also required extensive regulatory interfaces as this was a very unique site. It is not a DOE-owned facility. Rather, it is privately owned with the NRC license.

Through the closure project, the contractor focused on methods to minimize the amount of waste disposed. They successfully free-released 2 of the 5 facilities; reducing the amount of waste by nearly 400,000 cubic feet. They also implemented a method for identifying, isolating and removing the sources of contamination prior to demolition, thus minimizing the amount of waste that needed to be removed.

The contractor prepared a Standard Operating Procedure (SOP) specifically to handle the excavation of 4000 linear feet of piping. This NRC-approved procedure was a graded approach, which sampled the top 2 layers of soil, prior to excavation, thus minimizing the amount that had to be removed with the piping.

A third lesson for the Columbus Closure Project was the use of an onsite laboratory. In analyzing the costs and efficiencies between onsite and offsite, the contractor found it more efficient from a productivity perspective to use an onsite laboratory.

The waste volume increased nearly 3 times from what had been identified in the RFP and the contractor encountered higher levels of contamination. In addition, the increase would have significant impacts on the critical path. The waste shipments were also subject to weight limitations, thus minimizing how much could go in one shipment. One last issue the contractor encountered was incomplete site remediation. Some areas that were remediated by a previous contractor were found to still be contaminated. Thus, the contractor had to cleanup these sites before the project could be completed.

The lessons learned through this project include:

- Use of multiple disposal options, which successfully increased shipping productivity and achieving 50% savings on transportation costs
 - Transload rail yard
 - Transfer facility
 - Subtitle D landfills
 - Alternate sites such as the Nevada Test Site and Barnwell

- Contingency planning
 - Understand the treatment and disposal equation as it relates to productivity levels
 - Maximize the disposal options
- People, people, people – communication is key

Waste Management – Questions

What was the value of the onsite laboratory?

- Glenn Henderson – The turnaround time outweighed that of an offsite laboratory.

How can DOE achieve uniformity of the AB across the complex?

- Dave Swale – DOE-HQ is working on a template that sites can use.