Proceedings of the 15th International Symposium on the Packaging and Transportation of Radioactive Materials
PATRAM 2007
October 21-26, 2007, Miami, Florida, USA

KEYS TO SUCCESS OF THE LANL TA-18 FACILITY NUCLEAR MATERIAL DE-INVENTORY PROJECT

Paul T. Mann
U. S. Department of Energy, Albuquerque, NM, USA

James B. Tollison
SAIC, Albuquerque, NM, USA

Abstract

The U. S. Department of Energy (DOE) made a decision to relocate the criticality experiment capabilities residing at the Los Alamos National Laboratory (LANL) TA-18 facility to Nevada necessitating the relocation of significant nuclear material. This paper presents lessons learned from the Federal Type B packaging and transportation leadership perspective for the multi-year de-inventory of the TA-18 facility. The timeline for this project was thought to be unachievable by many.

This paper acquaints the reader with the facilities involved and the packaging and transportation requirements that constrained this effort and focuses on how many aspects of the project were dealt with to achieve success. Neither the TA-18 nor the receiver facility was designed to accommodate high volume material shipments necessary for success. Organizational opposition to the project within the laboratories is described as well as how it was overcome. Successful techniques for managing and integrating this multi-corporate project are described. The TA-18 project involved packaging, transportation, nuclear material storage facilities, and project management resources from DOE sites at LANL, Lawrence Livermore National Laboratory, BWXT Y-12, Savannah River Site, Kansas City Plant, Nevada Test Site, DOE Site Offices, and key DOE Office of Defense Programs organizations.

Baseline management tools were utilized to facilitate participants buy in. Much effort went into limiting the project controls function as schedulers began to overshadow the rest of the project. A guiding principle was to prevent paralysis often caused by over-planning. Another key role was to assure effective leaders and doers were assigned to the project as fast-track projects cannot tolerate ineffective personnel and be successful. Roles and responsibilities were clarified with a focus on avoiding diffusion of responsibility. Equal focus was given to the main receiver site since it was under development during this time and had many similar issues to resolve. Murphy's Law always applies leading to unplanned shortfalls. An atmosphere must exist were these shortfalls are not covered up. Finally, managers must be aware of hidden agendas that can detract from project goals.

The success of this project was no accident and was dependent on many of the leadership skills highlighted in this paper.

Introduction

In December 2002, the National Nuclear Security Agency (NNSA) issued a Record of Decision announcing the intent to relocate safeguards Category I and II missions and associated special nuclear materials (SNM) from Los Alamos National Laboratory (LANL) Technical Area 18 (TA-18) to the Device Assembly Facility (DAF) at the Nevada Test Site. The Category I and II missions support nuclear criticality safety, nuclear emergency response, nuclear nonproliferation, and homeland security. A wide range of SNM supporting these missions needed to be relocated to the DAF. TA-18 was the only facility in the United States with the capability of performing general purpose nuclear materials handling experiments, measurements, and training.

The SNM de-inventory and relocation project was part of a larger project to modify the DAF to establish a criticality experiment facility (CEF), which will continue the Category I and II missions that were conducted at TA-18. Through the CEF Project, the Department of Energy (DOE) is modifying the DAF to accommodate critical assemblies and permanent SNM storage vaults. The CEF project is expected to be complete in the 2010 timeframe. A decision was made to move the safeguards Category I and II SNM from TA-18 to the DAF early in the CEF project in order to minimize the security risk and costs across the DOE complex. This early movement of material was a key step in the NNSA's efforts to consolidate and move material to more secure locations to enhance security. The early move allowed NNSA to reduce overall security costs while upgrading the level of protection for the material.

ORGANIZATIONAL CLIMATE

One of the problems the authors encountered on this project was substantial opposition to the mission and material relocation at both LANL and the DAF. Obviously, the project was going to change the status quo by moving criticality experiment operations from Los Alamos to the Nevada Test Site. Los Alamos personnel were not pleased to see this mission being moved over 600 miles away, and the DAF personnel were not pleased with having to deal with the influx of a large amount of SNM. The packaging and transportation team needed a significant amount of material characterization information early in the project in order to prepare Safety Analysis Reports for Packaging amendments for new contents and to design any new containers that might be needed to move materials. The authors remained persistent in meeting with Los Alamos personnel to accelerate the material characterization. A working team was established to compile this information and work with the criticality experimenters to designate which materials would be moved to the DAF, which materials would remain at Los Alamos, and which materials would be sent elsewhere as excess. Hidden agendas of various groups caused the identification and characterization of material to take much longer than anticipated. After the authors focused on facilitating the total project and on solving the motivational issues, necessary characterization information materialized in a more timely fashion.

In retrospect, one of the challenges of this project was taking a facility accustomed to operating on an experimental project pace and moving them to operate at a fast-track project pace. Bringing in personnel from other organizations that have operated on this type of accelerated schedule can help the entire organization to become more responsive and focused on achieving results quickly. The packaging issues associated with this project were less of a problem than the authors' efforts to work through some of the organizational challenges.

INITIAL PROJECT ORGANIZATION AND ACTIVITIES

The authors strategy for success was to form a strong, Federally-led packaging and transportation team that included representatives from LANL, Lawrence Livermore National Laboratory (LLNL), the DAF, the package engineering and design sites, the NNSA Packaging Certification Division, and NNSA Headquarters. This team determined that numerous face-to-face meetings would facilitate cooperation and timely resolution of issues identified by the team. These meetings were supplemented with weekly telephone conference calls to track progress on issues and actions identified in the meetings and make sure they were completed. Additionally, the team worked closely with the experimenters to define the scope of the relocation project.

DEFINING PROJECT SCOPE

The TA-18 facility had accumulated a significant amount of SNM over the years. The initial phase of the project consisted of working with the experimenters and the responsible Headquarters Program offices to determine what material still had a programmatic use and needed to be moved to the DAF. Other material would be identified as excess and shipped offsite to a disposition site while still other material would be relocated internally within LANL. One of the issues that continued to affect this project was that the programmatic material list kept changing. Despite everyone's efforts to finalize the programmatic materials list it kept changing even after the initial shipments to the DAF began. The authors are not sure how the programmatic material list could have been fixed earlier in the project but recognize that the changes did inject more complexity into the planning and execution process.

Another factor the team had to deal with was the fact that much of the material for relocation was fairly old and had been at the TA-18 facility for decades. Consequently, highly detailed characterization information that was needed to assign the proper shipping container or to use for safety analysis did not exist. Older records simply did not contain as much detail as newer records are currently required to have. In some cases, items were transported to the TA-18 site from elsewhere at Los Alamos and little paperwork was generated and saved which further exacerbated the problem. Much of the project planning was done using the available data. The TA-18 personnel worked expeditiously to confirm existing information and obtain more detailed information on many of the items. Limited nuclear material operations could be conducted at TA-18, due to facility operational limitations, so characterization work had to be prioritized with operations and experimental work. The authors believe that the opposition or lack of enthusiasm for the project also contributed to a longer time period in collecting the required characterization information.

RECEIVER SITE ISSUES

The DAF did not initially have the approved facility authorizations to accept and store this amount of SNM. The DAF was a key part of the team and worked to identify issues and evaluate information from their unique perspective. The team worked with the receiver site to help them with the various facility safety studies and authorization basis activities requiring completion in order to receive the TA-18 material. Details were worked out through various face-to-face meetings and telephone conference calls coordinated by the Federal team leader. The team developed a TA-18 Early Move Shipment Definition document. This controlled copy document defined the various planned shipments and their contents. The document included information such as proposed shipment dates, material, type and number of containers in the shipment, and any other pertinent information on the shipments. Additionally, the document defined the shipper and receiver site agreement information and the DAF caveat on only

accepting mission essential materials. The document also contained a listing of materials awaiting shipping configuration definition. This listing enabled the identification of all the programmatic materials in one place and made sure the materials of concern were not forgotten. The document was updated on an as-needed basis, and all updates were approved by key representatives of the team.

MANAGEMENT STRATEGIES FOR SUCCESS

Organizational Attitudes

It became apparent that in addition to the technical challenges associated with moving a large amount of SNM across the country, the team would also have to deal with organizational attitude challenges. As previously mentioned, both the shipping and receiving sites were not enthusiastic supporters of this project. One of the big challenges for the team was to find a way for the people involved in the project at these sites to take ownership and focus on results. The LANL experimenters were not pleased that the criticality experiment machines and mission was moving to the DAF. The experimenters were critical in defining what materials needed to be relocated so their participation with the team was crucial. The team enlisted the assistance of upper level NNSA Headquarters management to work with LANL management to help arrange LANL priorities so that the necessary work would be accomplished in alignment with project milestones.

Additionally, the DAF presented some initial organizational resistance issues for the authors. The DAF is used by both LANL and the Lawrence Livermore National Laboratory (LLNL), with LLNL personnel having overall management responsibilities for the facility. The early move of material to the DAF created a very large amount of work in the facility authorization and safety basis areas at the DAF. In addition to the significantly increased workload, roles and responsibilities needed to be sorted out between the two laboratories. The authors facilitated this process by working with Headquarters and the Nevada Site Office, the Federal organization with direct oversight responsibilities for the DAF, to resolve these issues.

Proper Perspective for Project Controls and Planning

The packaging and transportation of the TA-18 SNM was a subset of the Criticality Experiment Facility (CEF) Project. The CEF Project's main focus was the modification of rooms at the DAF to house the criticality experiment machines. The CEF Project developed a very extensive project controls organization. That organization began to increase the monthly reporting requirements for all areas of the project including the packaging and transportation area for the early movement of material. It got to the point that the team was spending a significant portion of time trying to meet all the project controls requests and was losing focus and resources to devote to the real mission of moving the materials. The project controls team became more of a policeman (here is the schedule, now meet it). The authors' challenge was to prevent the project control activities from slowing progress. The solution was to maintain a continuing role of identifying problems and focusing on solutions instead of further refinement to schedule and resource planning. The policeman approach did not facilitate issue identification and resolution. The authors focused on reducing the CEF Project control requirements and on insulating the team's personnel from these requirements in order to keep the team's resources focused on the mission. The lesson learned was that while project controls are a necessary part of any project, emphasis on project controls can become too great and start diverting resources from the real mission of the project. The authors believe that project controls should be more of a tool to

organize a project rather than being the actual implementing vehicle that only focuses on meeting milestones without a mechanism for proactively identifying issues and solutions.

Similarly, over-planning a project needs to be avoided. The TA-18 team tended to continually refine plans in order to ensure everything was addressed. The project manager needs to be very aware of the balance between planning and the actual execution of the project. Over-planning can also lead to the team drifting off course and spending too much time on issues that are not really necessary in accomplishing the task. The TA-18 project was complex and took place against the backdrop of internal material movements to other facilities within LANL. The offsite material movements were not the only activities LANL had to factor into their planning. LANL also conducted significant internal coordination with these facilities regarding both short- and long-term storage of some TA-18 materials. The authors continually worked with the team to evaluate and identify the relevant issues that needed to be addressed in order to complete the shipments and stay focused on them. Continuous prioritization of issues along with the allocation of resources to address the critical issues was essential. A lesson learned is that often there are many other activities that need to be integrated besides the obvious activities associated with your particular project.

Schedule Constraints

Managers should recognize that schedule constraints can lead to decisions that are not optimal. One example of this on the TA-18 project was the effort to design a container to move the Jemima Plates. These materials were large diameter uranium plates that did not fit in an existing container. The original approach was to design a small container to protect the plates and move them with a national security exemption in a safe but regulatory non-compliant manner. The container designers proposed an approach to design a container that could move the Jemima Plates and ultimately be certified for moving other fuel plates. The Jemima Plates would still be moved under a national security exemption under this approach due to schedule requirements, and then the container would be certified for other additional contents. Unfortunately, the design kept changing and growing in size to the point where its only use was for the Jemima Plates. The team allowed changes to the container design late in the process both from the package designer and the laboratory. The changes were also driven to some extent by delays in receiving complete characterization data. A lesson learned from this part of the project is that even with the best oversight and intentions sometimes limitations of schedule and capabilities will preclude producing the best, most optimal product.

Facility Restrictions

LANL, being a national laboratory with a strong research focus, experienced some issues in working toward achieving results on a “fast-track” project schedule. The authors continually worked with LANL to focus on activities necessary to achieve results and to identify work restrictions, processes, and procedures that could be changed to increase productivity. Continual pressure to achieve results to meet the Secretary of Energy’s goals and timelines led LANL to eventually assign good productive people to the TA-18 project. A key element of success was the hiring of an experienced individual from the Rocky Flats site. This individual had experience with the SNM de-inventory of the Rocky Flats site on a very aggressive schedule and brought this experience to bear on the TA-18 project. He was instrumental in instituting procedures at TA-18 for streamlining the material handling process and for characterizing material; he also established processes to facilitate moving this material to the DAF. Eventually, LANL assigned an early move project manager who knew how to identify actions, make decisions, and work within the laboratory structure to make those actions happen. A lesson learned is that the caliber

and focus of people can make or break a project and sometimes bringing in talent from outside the organization can be a catalyst to implementing new and more effective ways of doing things.

Federal Management Role

The authors saw their role as facilitators in this multi-corporate environment to pull all organizations together and to help identify and resolve key issues. Strong Federal management is a must in this type of environment to get the various organizations to work together productively. The authors had knowledge of the internal workings of the laboratories (LANL and LLNL) and used that knowledge to work to get things done when issues stagnated. The authors also worked to get the laboratories to make decisions rather than trying to pass those decisions off to other organizations. The authors guided the team to define the necessary decisions and the logic behind the decisions including consequences of certain choices. For example, the team applied pressure for LANL to make the decisions about how to move the various experimental assemblies instead of passing those decisions on to the package engineers. A difficult part of the decisions was whether the devices should be disassembled rather than insisting on difficult transportation options.

The authors created an environment that was conducive to open communication, issue identification, and problem solving. The team adopted an attitude that early issue identification was critical, and everyone pulled together to reach a solution. A “don’t shoot the messenger” attitude was fostered along with a collaborative environment to work on solutions. The team benefited from this environment, and confidence grew as issues such as the need to dismantle certain experimental assemblies and how to minimize the number of new containers that would be needed were identified and addressed.

CONCLUSIONS

The LANL TA-18 early material move project was a success due to a number of factors. Strong Federal leadership was required to lead people in this multi-corporate environment to achieve results and get the various organizations to work together productively. The authors created an environment that was conducive to open communication, issue identification, and problem solving. The authors saw their role as facilitators in this multi-corporate environment to pull all organizations together to identify and resolve key issues.

The packaging issues associated with this project were more straightforward to deal with compared to the authors’ efforts to work through some of the organizational challenges and achieve results. The authors believe that the organizational opposition or lack of enthusiasm for the project made success more challenging. The authors focused on these issues and worked with Headquarters and the respective contractor management organizations to create project buy-in.

The project was conducted under very aggressive schedules leaving little room for error. Continuous prioritization of issues along with the allocation of resources to address the critical issues was essential in order to keep the project on schedule. The project also had to interface with other ongoing activities at the laboratories leading to the realization that often there are many other activities that need to be integrated besides the obvious activities associated with your particular project. Even with the best oversight and intentions sometimes limitations of schedule and capabilities will preclude producing the best, most optimal product.

While project controls are a necessary part of any project, emphasis on project controls can become too great and can start diverting resources from the real mission of the project. The

authors believe that project controls should be used as a tool to organize a project rather than being the actual implementing vehicle that only focuses on meeting milestones without working the issues to get results.

Finally, the caliber and focus of people can make or break a project, and sometimes bringing in talent from outside the organization can be a catalyst to implementing new and more effective ways of doing things.