SHARING EXPERTISE AND TECHNOLOGIES IN DEACTIVATING AND DECOMMISSIONING DOE'S CONTAMINATED EXCESS FACILITIES

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ABSTRACT

The overwhelming task that the U.S. Department of Energy (DOE) has in dispositioning its 10,000 or more unwanted and unneeded contaminated excess facilities can and will be accomplished by new approaches in technology and techniques that improve the disposition process. Many of these facilities are already under the management of the DOE Office of Environmental Management (EM) and, beginning in FY 2002, additional contaminated excess facilities will be transferred to EM adding to the enormous task of deactivation and decommissioning. This inventory of contaminated excess facilities requiring disposition includes some of the largest, most complex facilities in the world.

Historically, EM has not been as effective in sharing technologies and lessons learned at the working levels due in part to being organized along traditional business lines (e.g., nuclear material and facility stabilization, environmental restoration, waste management, etc.). In addition to a recent reorganization, EM has now identified a new approach to identifying and resolving issues and concerns regarding the disposition of DOE's facilities.

Significant progress has been made over the past few years in resolving the programmatic and technical challenges associated with facility disposition and EM has developed a means to share the tools and expertise among all DOE sites. Cost estimating, end state determination, facility evaluation, benchmarking, and lessons learned are but a few of the methodologies that have been developed by EM for disposition projects.

This paper will describe 1) recent initiatives to restructure the deactivation and decommissioning national programs to form a unified approach to facility disposition that addresses the entire seamless process in a manner that largely mirrors the way in which deactivation and decommissioning activities are actually being conducted at DOE's field sites and 2) the recently developed tools and capabilities available to the complex to aid in facility deactivation and decommissioning. Project managers, engineers, and planners engaged in the deactivation or decommissioning of facilities will be interested in DOE's new approach and how it has taken steps to share solutions to issues in this area of concern. There have been too many examples in the past of the "not invented here" syndrome. It is expected that the approach recently taken by EM will tear down these walls of resistance.

INTRODUCTION

For years, the U.S. Department of Energy (DOE) and its predecessor organizations operated specialized complexes across the nation for the purposes of nuclear weapons production and energy research. More than 10,000 facilities (referred to as "excess") are now unwanted and unneeded by DOE as the result of changing missions or the facilities becoming obsolete. The

Office of Environmental Management (EM) is currently responsible for the enormous task of dispositioning[a] excess contaminated facilities within the DOE complex. Many contaminated facilities have already been transferred to EM and there are significantly more that will be transferred from DOE operating programs to EM beginning in FY 2002. This inventory of excess facilities includes some of the largest, most complex facilities in the world. Many are contaminated with radioactive and hazardous substances and were built with materials such as asbestos and polychlorinated biphenyls, which are now tightly regulated. Current estimates of the total cost to disposition these facilities are over $32 billion over the next 70 years.

A DOE facility that has been declared or forecast to be excess to current and future mission needs enters the transition phase of its life cycle which involves identifying hazards and taking actions to eliminate or mitigate the hazards and placing the facility in a safe condition with only minimum maintenance required. During this period the programmatic and financial responsibilities are transferred from the operating program (e.g., DOE Offices of Defense Programs, Nuclear Energy, and Science) to a disposition program (usually EM).

Following operational shutdown and transition, the first disposition[b] activity, usually, is to deactivate the facility. The deactivation mission is to continue taking appropriate action to place a facility in a safe condition that is economical to monitor and maintain for an extended period, until the eventual decommissioning of the facility. The final facility disposition activity is typically decommissioning, where the facility is taken to its ultimate end state through decontamination and dismantlement to demolition or entombment. Surveillance and maintenance (S&M) activities (e.g., periodic inspections and maintenance of the facility to ensure that contamination is contained and potential hazards are eliminated or mitigated and controlled) are conducted throughout the facility's life cycle, including the disposition phase.

Over the past several years, EM has made significant progress in resolving the programmatic and technical challenges associated with facility disposition. Facility transfer reviews, cost estimating and end state determinations are but a few of the methodologies that have been developed by EM to aid in facility disposition. Similarly, EM has developed a framework, regulatory policy, benchmarking, and lessons learned to assist in the decommissioning arena.

In 1999, EM was reorganized and responsibilities were shifted from a business area focus (i.e., nuclear material and facility stabilization, environmental restoration, waste management, etc.) to a site-based structure (e.g., Offices of Integration and Disposition, Site Closure, Project Completion). All integration activities, including multi-site service offerings such as deactivation and decommissioning, were assigned to the new Office of Integration and Disposition (EM-20). As a result of the reassignment of these activities, it became apparent that the structure of the EM national programs responsible for deactivation and decommissioning must also evolve to ensure continued success in meeting facility disposition challenges.

REQUIREMENTS AND GUIDANCE

DOE Order 430.1A, LIFE CYCLE ASSET MANAGEMENT (1), was revised to ensure that requirements for the entire life cycle of the facility are included and a seamless process is in

place from the time a facility is declared excess until its final disposition. DOE O 430.1A requirements can be met through use of four implementation guides[c]. They are:

- DOE Guide 430.1-2, IMPLEMENTATION GUIDE FOR SURVEILLANCE AND MAINTENANCE DURING FACILITY TRANSITION AND DISPOSITION (2) defines a process to monitor, document, and maintain the presence, status, and condition of subsystems, components, and hazardous materials associated with the facility as well as maintaining a safe shutdown configuration.
- DOE Guide 430.1-3, DEACTIVATION IMPLEMENTATION GUIDE (3) defines the process of continuing to place a facility in a stable and known condition to minimize existing risks and associated costs of S&M for an extended period of time.
- DOE Guide 430.1-4, DECOMMISSIONING IMPLEMENTATION GUIDE (4) defines the process which identifies the actions taken at the end of a facility life to retire it from service with adequate regard to the safety of workers, public, and environment.
- DOE Guide 430.1-5, TRANSITION IMPLEMENTATION GUIDE (5) defines a process to minimize total cleanup costs by the identification and performance of actions that should be accomplished to place the facility in a stable and known condition while the facility is in the final stages of its operation phase.

EVOLUTION OF DEACTIVATION AND DECOMMISSIONING NATIONAL PROGRAMS

Prior to 1999, the DOE/EM-Headquarters (EM-HQ) program was organized along traditional business lines (e.g., by activity). In other words, individual DOE offices existed for environmental restoration, waste management, and nuclear material and facility stabilization. In general, each of these offices had responsibilities at all of the DOE sites. For instance, the Office of Environmental Restoration was responsible for decommissioning at the Hanford site while deactivation activities at Hanford were under the purview of the Office of Nuclear Materials and Facility Stabilization. Additionally, each of these offices conducted a DOE complex-wide integration function for their particular business area.

EM-HQ has now been reorganized and responsibilities were shifted from the business area focus to a site-based (or project-based) structure. The newly created Office of Site Closure (EM-30) was given responsibility for cleanup at the DOE sites scheduled for completion and closure by 2006. This responsibility includes sites within the Albuquerque, Chicago, Nevada, Oak Ridge, Oakland, Ohio, and Rocky Flats Field and Operations Offices. Responsibility for the Idaho, Richland, and Savannah River Operations Offices was assigned to the Office of Project Completion (EM-40). The roles of these two new EM-HQ organizations were defined to include site guidance and direction, resource allocation, site analysis, site advocacy, policy evaluation, priority determination, and program performance measures monitoring. Being a site-based structure, EM-30 or EM-40 will now manage and conduct the activities outlined above regardless of the business area.

The reorganization also affected EM-HQ's integration structure. All integration activities, including multi-site service offerings such as deactivation and decommissioning, are assigned to the new EM-20 office. Most DOE sites were already conducting deactivation and

decommissioning operations (project management, project planning, budgeting, and execution of the work) under a single organization unit, therefore it was prudent for to merge EM-HQ deactivation and decommissioning integrating functions into a single organization. Since sharing expertise and technologies in the deactivation and decommissioning of DOE's contaminated excess facilities was now under EM-20's purview, responsibilities were now focused on:

- Policy, planning, technical, and analytical guidance;
- Deactivation and decommissioning lessons learned;
- Hands-on technical assistance;
- Site-specific and multi-site issue resolution; and
- Policies for the transfer of facilities from other DOE organizations.

With the merging of deactivation and decommissioning integrating functions at an EM-HQ level, EM-20 decided to analyze potential roles and responsibilities in these two areas and provide further definition. Specifically, EM-20 set out to: 1) determine the roles of EM-20 in supporting EM-HQ programs and the sites and 2) determine the roles of the Deactivation and Decommissioning Committees and how the National Facility Deactivation Initiative (NFDI) team[d] could support both deactivation and decommissioning activities. To accomplish these two objectives, EM-20 planned to interview EM-HQ and site personnel, evaluate the responses, and revise roles and responsibilities if necessary.

EM-20 interviewed EM-HQ Program Managers representing nine different sites in the EM-30 and EM-40 programs, including three office directors and eleven site team members to obtain their views as to the role of the EM-20 Office and how it could better support EM-HQ and site programs. In addition, nineteen site personnel representing federal staff and contractors at seven sites participated in the interviews.

Generally, the recommendations from all of the interviewees were similar. Recommendations for EM-20's role in supporting EM-HQ in deactivation and decommissioning activities included:

- Assisting in pre-planning activities and ensuring that activities are completed and problems are resolved;
- Assisting in budget formulation, performance measures definition/tracking, and strategic planning;
- Serving as a programmatic, regulatory, and technical resource/work directly with the EM-HQ program managers;
- Meeting with the EM-30 and EM-40 staff periodically to communicate issues and initiatives and educate them on available tools and guidance;
- Assisting in identification and implementation of lessons learned from other sites around the DOE complex;
- Serving as a clearinghouse for the problems complex-wide and inform the EM-HQ program managers of the problems at their sites; and
- Acting as a resource for additional information.

Recommendations for EM-20's role in supporting sites in deactivation and decommissioning activities included:

- Serving as an overall clearinghouse at the EM-HQ level that the sites contact with questions;
- Coordinating deactivation and decommissioning complex-wide;
- Providing a corporate view on how HQ wants the sites to proceed in certain areas; and
- Transmitting information to the sites about issues that impact multiple sites.

In addition to the EM offices discussed previously, two other organizations involved in deactivation and decommissioning were formed over time with the intent of sharing their expertise. The DOE HQ/Field National Decommissioning Committee (initiated in 1992) and the National Deactivation Committee (established in 1998) were formed to promote safe, efficient, cost-effective deactivation and decommissioning across the complex. The two committees provide leadership in the facility disposition area through a consortium of EM-HQ and site representatives. Neither committee had a charter nor were the roles and responsibilities clearly defined.

The Deactivation Committee operated at a different level than the Decommissioning Committee and its technical support team (NFDI) provided "hands-on" support to deactivation projects. In recent years, the Decommissioning Committee has operated at a more "philosophical" level. They meet to discuss lessons learned, project status, and complex-wide policy and guidance. A meeting was held in April 2000 to discuss these differences and the interview results, and consider alternatives for the future direction of the two committees.

NATIONAL DEACTIVATION AND DECOMMISSIONING COMMITTEE

As the result of the April meeting, the two committees agreed that by joining forces, they could be of greater value to the DOE complex at large. Therefore, they endorsed forming a new committee structure that would function more in line with the current EM organization at DOE-HQ and be more in concert with the "facility disposition as a seamless process" philosophy of DOE O 430.1A. It is expected that, as a result of the combined focus of the two committees, the barriers that existed due to the artificial separation of deactivation activities from decommissioning activities can be eliminated and replaced by facility disposition activities that more closely mirror the way disposition activities are being conducted in the field.

Other potential benefits of this merger included improved focus, increased efficiency, enhanced integration, and better communication. Due to the combined focus of the two former committees, the NFDI team and the tools that have been developed to date and those yet to be identified could be utilized more broadly across the DOE complex. It was even more important that EM elevate NFDI to the next level of support since NFDI was more recognized at senior management levels.

A workshop was conducted in July 2000 to bring the former committees together to develop a committee charter, structure, and roles and responsibilities. The meeting was intended to define "who we are, what we do, how we do it." Merging the committees and cross pollinating the positive aspects of each former committee; clarifying roles and responsibilities; and resolution of issues and confusion were among the items to be addressed. In addition, there was a consensus

that the combined committee should be more proactive and any artificial roadblocks would be removed building a framework that allows the committee to accomplish more.

The National Deactivation and Decommissioning Committee was formalized during the workshop. The Chair and Deputy Chair represent the Office of Technical Program Integration (EM-22). The Committee consists of one representative each from the EM-30, EM-40, and EM-50 EM-HQ organizations. Other members consist of one Federal representative and one contractor from each DOE site. Multiple Federal employees could be assigned from a site if facility disposition activities are not all within a single organization, or if desired by the site's management. Multiple contractor representatives can be assigned if facility disposition activities are not all within one contractor's responsibility, or if desired by the site's DOE Organization. Each site is designated only one vote on Committee matters.

Working Groups

Standing and Ad Hoc Working groups (i.e., subcommittees) are established to address the specific issues identified by the Committee. Representation on the working groups consists of Committee members, technical support contractors, and other involved parties, based on individual interests and experience relative to the working group scope. The working groups report to the committee at large for implementation of recommended actions.

The Deactivation and Decommissioning Focus Area (DDFA) User Steering Committee is the only Standing Working Group that has been formed to date. This Working Group is tasked to provide a continuing interface with the DDFA at the National Environmental Technology Laboratory in the development and deployment of technologies at DOE sites. The DDFA mission is to develop, demonstrate, and deploy improved technologies and systems that expedite or otherwise improve the decontamination and decommissioning of DOE's radiologically and hazardous chemically contaminated excess facilities and their contents; to solve customer-identified needs; and to facilitate the acceptance, approval, transfer, commercialization, and implementation of these technologies and systems. The DDFA User Steering Committee is responsible for providing input into the review and approval of the DDFA's direction, policy, priorities, budget, and program planning. The DDFA User Steering Committee functions as a coordination group through which the user community can interact with the DDFA.

The four current Ad Hoc Working Groups (Facility Disposition Long Range Planning, Equipment Loan Initiative, Executive Briefing/Best-in-Class Marketing Strategy, and Policies/Procedures) are focused on activities that are intended to assist the Committee as well as others at the DOE sites in accomplishing D&D work and raising the level of recognition of the D&D Committee.

Figure 1 depicts the Committee structure including the Standing and Ad Hoc Working Groups.

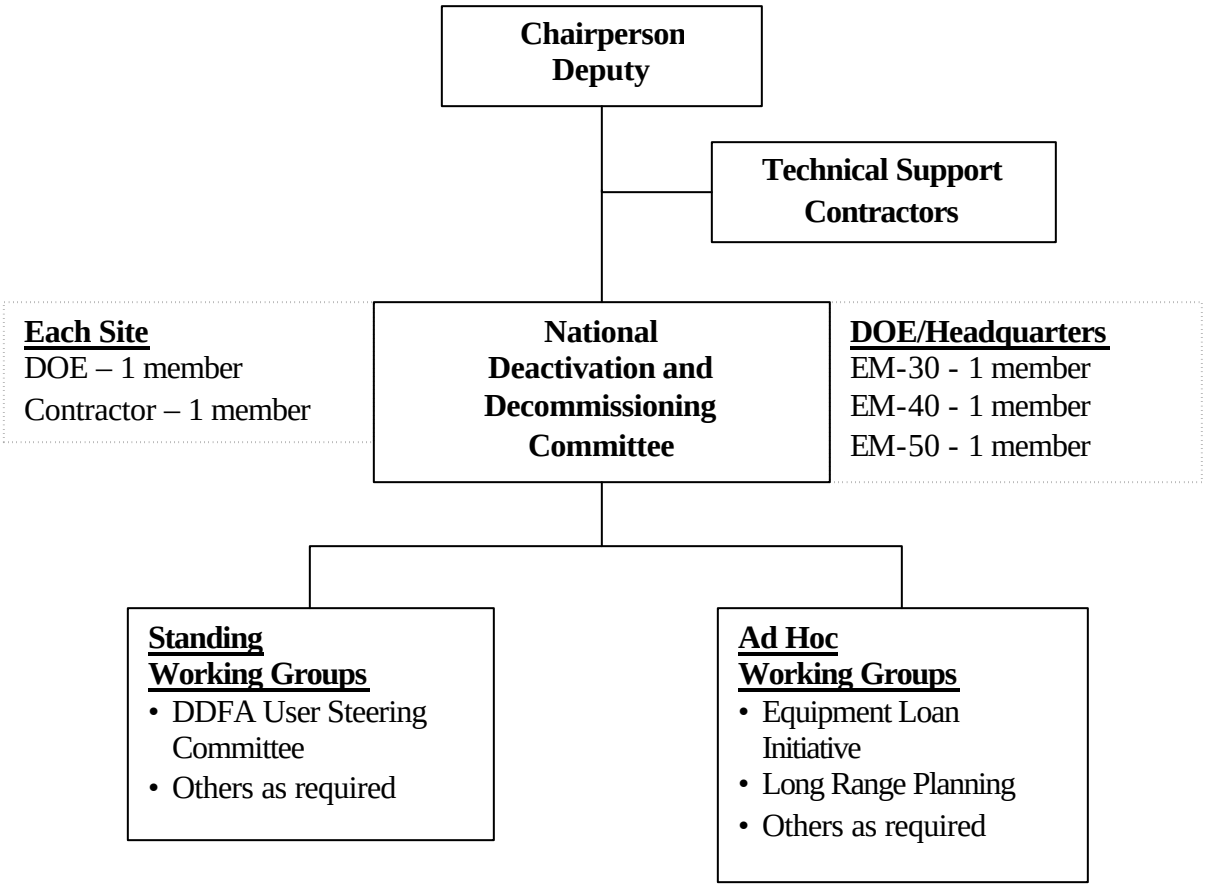

Fig. 1. National Deactivation and Decommissioning Committee Organization

National D&D Committee Charter

The National D&D Committee established a charter that contains both mission and objective statements. The Committee's mission is to identify, promote and advocate the implementation of complex-wide strategies as well as policy and direction to manage DOE's facility disposition initiatives in a manner that will minimize life-cycle costs and reduce the risk associated with DOE facilities. These actions are intended to provide significant benefits in improving safety, reducing risks and mortgage, and reaching closure at DOE sites.

The objectives of the Committee are to provide communication and information, management interface, and project support for disposition activities by:

- Providing a working level interface between EM-HQ Program Offices and DOE sites involved in facility disposition projects working through EM-20.
- Providing short term, focused expertise to facility disposition activities.
- Advancing the state of the art for conducting facility disposition activities aimed at reducing mortgage costs, reducing hazards and risks, and accelerating schedules.

- Providing a positive and proactive advocacy for facility disposition actions.
- Ensuring that all phases of facility disposition conform to the DOE O 430.1A requirements for a seamless facility life-cycle process.
- Proactively identifying, recommending, and/or implementing DOE solutions and policies for crosscutting issues affecting facility disposition actions.
- Supporting the establishment of consistent approaches and standards as appropriate, and the understanding and validation of different approaches as mandated by specific circumstances.
- Serving as a champion for facilitating decision making for programmatic issues affecting and impeding the accomplishment of facility disposition actions and/or objectives.
- Providing direction to EM technical support organizations, such as the NFDI team for effective hands-on technical support to the facility disposition community.
- Supporting an effective lessons learned process that involves both contributing to and utilizing the overall EM and DOE lessons learned programs in the area of facility disposition.
- Pursuing benchmarking of facility disposition practices at various DOE and commercial locations for the purpose of learning from the experience of others and improving DOE performance.
- Providing direction to the Deactivation and Decommissioning Focus Area through the DDFA User Steering Committee to ensure an effective technology development and deployment program that supports the facility disposition community.
- Providing and serving as subject matter and technical experts for facility disposition actions through working group activities, special initiatives, and in meetings, conferences, workshops, or other gatherings relating to facility disposition.
- Interfacing with other DOE, federal, and commercial organizations to ensure that DOE facilities are dispositioned safely and efficiently and facility disposition projects are conducted in accordance with departmental and external requirements.

TOOLS AND CAPABILITIES

During the process of identifying and resolving issues related to the deactivation and decommissioning of DOE's contaminated excess facilities, several "tools" were developed by DOE to attain cost-effective and efficient implementation of actions necessary to reach the desired facility interim or final end state. The development of deactivation methodologies and tools, for the most part, was based on experience and lessons learned during a pilot deactivation project at the Hanford Site in Richland, WA.

Through the formalization of the National Facility Deactivation Initiative (NFDI) that provides hands-on support to site deactivation projects, refinements to the early tools have been made and a number of other methods and tools have been added. Most importantly, these methods and tools have been applied and hands-on technical assistance has also been made available to many DOE sites to assist in their deactivation efforts. Development, testing and effective deployment of technical tools at a number of deactivation projects has resulted in improved alternatives analysis, project definition and deactivation implementation.

A deactivation web site; DOE/EM-0383, *Decommissioning Handbook: Procedures and Practices for Decommissioning* (6); EM Lessons Learned; the *Requirements Based Surveillance and Maintenance* guidance and software; the POWERtool (Planning, Optimization, Waste

Estimating and Resourcing); End Point Development process and software; and a Facility Walk-down/Evaluation process and checklist are examples of shared resources available to those involved with disposition activities at their sites. Other deactivation and decommissioning examples and information are available on the EM-20 web page at www.em.doe.gov/integrat/ for all phases of facility disposition.

Deactivation Web Site

A new deactivation web site has replaced the former DOE/EM-0318, *Facility Deactivation Methods and Practices Handbook* that primarily provided specific guidance on a process and methodologies to establish "end-points" to determine under what circumstances a facility would be in a safe condition and could be maintained at a low cost. This web site was developed in coordination with the Office of Management and Information (EM-7) and the EM Web Team at the Oak Ridge National Laboratory as part of the overall EM-20 Web Page upgrade project. While it currently is focused on deactivation, the contents are also applicable to the other three excess facility life cycle phases of stabilization, surveillance and maintenance, and decommissioning. This site serves as the primary reference for "how to" information and includes extensive experience in the form of lessons learned as well as methods and examples for deactivation and decommissioning project management, end-points management, survey and transfer of facilities and surveillance and maintenance review. DOE and contractor staff are able to use the materials on this web site to help in the start of new projects, and to access past experience that is consistent with DOE O 430.1A.

Decommissioning Handbook

The objective of DOE/EM-0383, *Decommissioning Handbook: Procedures and Practices for Decommissioning* (6)[e] is to use examples and information about lessons learned to illustrate established procedures and practices that are adequate to implement the DOE decommissioning framework, as defined in DOE G 430.1-4. This Guide was prepared to provide guidance for implementing the requirements of DOE O 430.1A and aid in the planning and implementation of decommissioning activities at DOE facilities that have been declared excess to any future mission requirements.

DOE/EM-0383 provides contractors and DOE personnel with non-mandatory guidance and information about DOE's expectations on meeting existing requirements and DOE policies. Specifically, this handbook illustrates procedures and practices that are consistent with the acceptable methods and approaches discussed in DOE G 430.1-4.

EM Lessons Learned

To put more emphasis on EM and its contractor personnel for capturing and using lessons learned information, EM developed its own Lessons Learned Program in conjunction with the DOE Lessons Learned Program. EM personnel are active members and officers in the DOE Society for Effective Lessons Learned Sharing (SELLS). By establishing its own program, EM is focusing on EM specific business and functional areas, and promoting sharing of knowledge, expertise and good work practices to reduce risk, reduce cost, and promote fewer mistakes.

EM is evaluating lessons learned program activities as part of independent program and project reviews, requiring lessons learned be shared as part of mid-year and year-end reviews, including lessons learned language in EM guidance documents and plans, offering on-the-spot awards as incentive to utilize lessons learned information in program activities, and providing forums to exchange or disseminate information such as the Technical Information Exchange (TIE) Workshop, National Deactivation and Decommissioning Committee meetings, the EM Lessons Learned Program web site[f], the EM Lessons Learned List Server, EM-HQ program managers' conference calls and meetings, mid-year and year-end reports, and other various meetings and workshops.

Requirements Based Surveillance and Maintenance

Accelerating site cleanup to reduce facility risks to the workers, the public and the environment during a time of declining federal budgets represents a significant technical and economic challenge to DOE Field and Operations Offices and their respective contractors. A significant portion of a facility's recurring annual expenses are associated with routine, long-term S&M activities. However, ongoing S&M activities do nothing to reduce risks and basically spend money that could be reallocated towards facility deactivation.

To facilitate this outcome, DOE has developed the *Requirements Based Surveillance and Maintenance (RBSM) Guidance*[g] and software. RBSM was developed with improving cost and schedule performance in mind. It is a review and evaluation process for use by site personnel that provides a systematic and thorough review of the existing S&M activities and explores the driver or need (regulatory requirement, DOE Order, etc.) for continuing the activity. The product from implementing the RBSM process is the identification of potential elimination and/or reductions in S&M activities in order to reallocate funding and labor resources to other mission direct work that accelerates facility cleanup and ultimate site closure. The software aids in capturing responses to the RBSM process questions and builds a database for future reference and needs.

POWERtool

The POWERtool is a hand-held field estimating unit and relational database[h] software "tool" for optimizing disassembly and final waste form of radiologically or hazardous chemically contaminated systems and equipment. It provides systematic cost estimates and plans for the decontamination, dismantlement and waste disposal of contaminated systems. The "tool" lends itself to consideration of alternative methods that optimize between important attributes including; labor cost, waste disposal, and schedule. A small hand-held PC is used for field estimating and a flash RAM card can be transferred from the hand-held unit to a desktop computer for further estimating/computation. The next generation of the computer used for POWERtool now has the capability of digital pictures to aid in documentation.

The workspace of the "tool" consists of columns for dividing the facility under review into subsets and rows made up of tasks and subtasks. The workspace connects to libraries for each estimate entered. A field estimating screen, report manager, backup database, and program setup menu are part of the "tool". Several labor categories are included. The database is capable of

storing multiple disposition scenarios so that assumptions can be changed and scenarios can be compared.

The POWERtool is fast and portable (it can be taken into the facility). The "tool" provides standard reports, but custom reports can be developed.

End Point Development Process and Software

DOE O 430.1A requires that an end-point process is established in deactivation and decommissioning planning that identifies specific facility end-points and the activities needed to achieve those end-points. Just as the design specifications are essential to a construction project, specifying end-points is the key to answering when a deactivation or decommissioning project is complete. Specifying and achieving end-points is a systematic, engineering way of proceeding from an existing condition to a stated desired final set of conditions in which the facility is safe and can be economically monitored and maintained.

To assist in determining end-points, an end-point development process and software has been developed. End-points are derived from a methodical and practical process of determining the desired final state for each of the spaces and systems of a facility based on the objectives, tasks, and expected future uses pertinent to those systems and spaces. This process identifies specific end-points on which to focus effort and a defined basis for closure of the tasks performed. The software automatically generates an end-point document and creates a project schedule of end-points (i.e., milestones). End-points generated from previous projects are available for reference.

Specific end-points will vary from facility to facility due to the complexity and/or contaminants associated with the facility. The use of the end-point development process and software helps to ensure that the methods by which facility-specific end-points are defined remain consistent.

Facility Walk-down/Evaluation Checklist

A thorough and comprehensive walk-down procedure and checklist has been developed for surveying and assessing the condition and contents of a facility. Although this "tool" was developed for use in the transfer of a facility, it can be used during end-point planning, risk assessments, and other similar activities. The final report documents the results of the survey conducted at the facility.

The primary purpose of the survey is to identify facility conditions and to define the characterization, stabilization, and material/waste/equipment removal requirements that need to be met prior to transferring the facility from the operating program to the disposition program. Additionally, estimated post transfer S&M activities and associated costs are identified for transfer along with the facility. The information obtained also provides the disposition program with insight regarding the facility's risks and liabilities, which may influence the management of eventual downstream life-cycle activities.

Other Tools and Resources

Field workers, subject matter experts and safety professionals have designed an Automated Job Hazards Analysis (AJHA) process and software to identify and mitigate job hazards while employing a graded approach. This "tool" provides a means for the work team and safety professionals to evaluate the work activities during the planning stage in order to identify hazards and the associated controls that may be necessary. The process can be used as a computer "tool" or hard copy.

Several deactivation Project Management Plan (PMP) templates have been developed over the past few years. Templates have been created to assist the development of comprehensive but useful PMPs for new projects.

Extensive experience, examples, and guidance for development of necessary safety authorization basis documentation are available to all DOE sites. Examples include strategies for streamlining the development and approval process, minimization of unnecessary documentation and other related strategies. Consultation on processes, methodologies, and project development for alignment of processes and/or organizations (whole system architecture) has been used to expedite the deactivation of facilities with a changed or new mission.

Several workshops have been conducted to provide interested parties with current approaches, methods, tools, strategies, etc. for deactivation and decommissioning activities. Workshops or project start-up planning team consultations cover a broad range of subjects including; baseline planning/scheduling; engineering trade studies; characterization methodology; DOE O 430.1A implementation strategies; documentation of lessons learned; regulatory strategies; and the previously mentioned tools**.**

Although these tools have for the most part been used on deactivation activities to date, many of the available tools can be applied to transition, deactivation and decommissioning activities. Actions are currently underway to expand the NFDI toolbox to include new technologies that have been developed.

CONCLUSION

The disposition of DOE's radiologically and hazardous chemically contaminated excess facilities continues to be an immense undertaking, and resources are slim. It is imperative, therefore, that DOE and its operating and technical support contractors work together to help each other achieve goals and greater efficiencies, become more effective at what we do, and share expertise and lessons learned.

The EM program has undergone significant changes recently, and these changes have had a positive affect on the deactivation and decommissioning national programs. All facility disposition phases now have improved linkage and cohesion through the combination of the deactivation and decommissioning integration functions into EM-20 at EM-HQ and the formation of the National Deactivation and Decommissioning Committee. Tools and capabilities have been and will continue to be developed to assist these organizations in accomplishing

facility disposition in a safe, efficient, and cost-effective manner. Sharing both technologies and methodologies among the DOE sites is key to DOE's success in achieving a timely desired end state for DOE's contaminated facilities.

FOOTNOTES

[a]In accordance with DOE Order 430.1A, LIFE CYCLE ASSET MANAGEMENT, disposition activities are those that follow completion of program mission, including, but not limited to, surveillance and maintenance, deactivation, and decommissioning.
[b]The facility disposition phase as discussed here does not refer to management of spent-nuclear fuel, high-level waste, waste transportation and disposal, or soil remediation though related and critical to the accomplishment of facility disposition.
[c]DOE O 430.1A and the associated guidance documents are available in PDF or downloadable format at http://www.explorer.doe.gov
[d]The National Facility Deactivation Initiative (NFDI) team has been awarded the Vice President Al Gore Hammer Award in recognition of their cost-saving and innovative approach in resolving issues related to the deactivation of contaminated excess facilities throughout the DOE complex. The Hammer Award is presented to teams of federal and contractor employees who have made significant contributions in support of reinventing government principles.
[e]The Decommissioning Handbook is available in PDF or downloadable format at http://www.em.doe.gov/dd/decom_doc.html
[f]EM Lessons Learned Program web site is located at http://www.em.doe.gov/lessons
[g]The RBSM Review Guide is available in PDF or downloadable format at http://www.em.doe.gov/requireb/
[h]The relational database is in a Microsoft Access environment.

REFERENCES

1. DOE Order 430.1A, LIFE CYCLE ASSET MANAGEMENT
2. DOE Guide 430.1-2, IMPLEMENTATION GUIDE FOR SURVEILLANCE AND MAINTENANCE DURING FACILITY TRANSITION AND DISPOSITION
3. DOE Guide 430.1-3, DEACTIVATION IMPLEMENTATION GUIDE
4. DOE Guide 430.1-4, DECOMMISSIONING IMPLEMENTATION
5. DOE Guide 430.1-5, TRANSITION IMPLEMENTATION GUIDE
6. DOE/EM-0383, *Decommissioning Handbook: Procedures and Practices for Decommissioning*