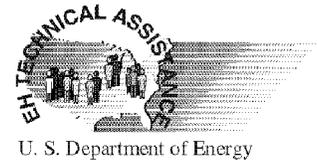


**ENVIRONMENT, SAFETY AND HEALTH
ONSITE TECHNICAL ASSISTANCE
ACTIVITY SUMMARY
APRIL–JUNE 1997**



During the second quarter, technical assistance efforts by the Office of Environment, Safety and Health focused on continuing to expand the implementation of Enhanced Work Planning (EWP) across the DOE complex and improving self-assessment programs and processes. The EWP Steering Committee continued to provide aggressive leadership in improving work planning and control processes, sharing information among DOE sites, and developing consistent approaches DOE-wide. In addition, the eight DOE sites implementing EWP continued to make significant progress in increasing safety, improving performance, and enhancing productivity. Projects to test improvements in self-assessment at DOE sites by increasing worker involvement and strengthening management commitment began to show substantial progress during this quarter.

The EWP Steering Committee, a national network of leaders from DOE sites that are implementing EWP, completed plans for the second EWP National Workshop to be held in August in Idaho Falls, Idaho. The committee also approved a training curriculum that provides an introduction to the EWP process, elements of EWP, and implementation issues for personnel involved in requesting, planning and executing work at DOE sites. The curriculum includes three courses and a team training “toolbox” that provides practical approaches for helping a team begin to implement an EWP project. The training was

“tested” through presentations to the EWP Steering Committee, the Sitewide Core Team for the Rocky Flats Environmental Technology Site, and the Sitewide Core Team for the Idaho National Engineering and Environmental Laboratory.

EWP implementation efforts at eight different DOE sites continued to reap substantial gains for the Department. Examples of accomplishments during the second quarter include—

- < The Sitewide EWP Working Team at Idaho helped to resolve work control issues in the Integrated Safety Plan relating to work order ownership, prework reviews, team reviews, approval and sign-offs, field changes, and criteria for work package approval.
- < A pilot project was initiated at the Mound Plant to improve the waste permit process by applying EWP principles to strengthen identification and analysis of wastes.
- < Installation and testing of the new Automated Worker Exposure Reporting System was completed at the Fernald Environmental Management Project. The system reduces the time required to query employee exposure records and enhances the ability to share information between the Medical Department and workers.
- < The EWP Team at the Y-12 Plant in Oak Ridge helped to enhance and test a standardized work package process, which has greatly aided efforts to restart operations in the 9212 Complex. This has accelerated planning

for more than 200 jobs that would otherwise have been planned separately, resulting in significant savings and acceleration of the schedule for completing work to support restart.

< At the Rocky Flats Environmental Technology Site, a series of working teams have been formed to test the use of EWP principles in completing a broad range of projects relating to deactivation, safe shutdown of facilities, decommissioning, and removal of equipment.

< Five separate EWP teams are working together at the Pantex Plant to reduce the number of maintenance-related events that adversely affect production in a key building. Since beginning work in 1997, the number of maintenance-related events has already decreased by more than 40 percent.

< During the second quarter, the Los Alamos National Laboratory began implementing its new work control process. The Laboratory Implementing Requirements document developed by the site's EWP Core Project Team addresses all aspects of work management from work request to work package closure.

< The Richland Operations Office and the Hanford Site Integration and Management Contractor are working together to build EWP products and results into all aspects of the site's Integrated Safety Management System.

Implementation of the new Hanford occupational health process continued during the second quarter. This new process is designed to place employees in appropriate medical and training programs based on risk and to establish feedback systems that provide for appropriate preventive measures. Virtually 100 percent of the prime contractors, major subcontractors, and enterprise companies completed employee job task analyses for their

workforces during the second quarter. The net result should be a significant reduction in the number of examinations with simultaneous improvement in the quality of the medical examination process.

EH technical specialists worked with personnel at five DOE sites to plan and initiate field demonstration projects testing a broad range of potential improvements in self-assessment during the second quarter. Efforts began at the Lawrence Berkeley National Laboratory, Rocky Flats Environmental Technology Site, Idaho National Engineering and Environmental Laboratory, Brookhaven National Laboratory, and the Ohio Field Office. The demonstration projects are focusing on developing and implementing self-assessment practices that encourage worker involvement, promote management commitment, and create an environment that supports continuous improvement. Each project involves reviewing current practices to identify possible gaps, identifying potential improvement opportunities, and testing the effectiveness of selected potential improvements.

At Lawrence Berkeley National Laboratory and Brookhaven National Laboratory, EH is working with DOE site offices to strengthen operational awareness programs. Efforts include defining appropriate operational awareness activities, planning methodologies, developing approaches for analyzing results from the program, and integrating the efforts of the entire DOE technical staff. For DOE's Brookhaven Group, EH is providing specific recommendations regarding development and implementation of effective operational awareness programs.#

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EWP STEERING COMMITTEE

The Enhanced Work Planning (EWP) Steering Committee met in Denver during June to pilot the EWP training curriculum, review the status of current committee projects, and set goals and objectives for the coming quarter. During the meeting, the Steering Committee finalized plans for the EWP National Core Team Leaders Workshop in Idaho Falls in August. The date, theme, agenda, and speakers were agreed on. Representatives from the Idaho Operations Office (ID) and Idaho National Engineering and Environmental Laboratory (INEEL) agreed to take the lead on the workshop with support from Headquarters and other DOE sites as needed. Members of the committee will provide strong support and participation at the conference as well as work with other DOE sites not currently participating in EWP to facilitate interest and attendance.

As an outgrowth of this meeting, the Steering Committee agreed to focus its efforts on the following goals for the third quarter:

- < Promote the use of the EWP training curriculum at all sites to better enhance the consistency of EWP programs across the DOE complex.
- < Develop consistent, complexwide performance indicators at three levels: DOE's overall mission indicators, EWP programmatic indicators, and site-specific indicators.
- < Publish a revised and updated cross-pollination document to improve the sharing of products and tools developed by sites participating in EWP throughout the DOE complex.
- < Expand the EWP Steering Committee to broaden participation from DOE field office personnel.

While the June steering committee meeting covered many topics of importance to the field, its primary purpose was to review and approve a departmental EWP training curriculum. The curriculum provides an introduction to the EWP process and includes training on EWP elements and implementation for personnel involved with requesting, planning, and executing work at DOE sites. It can be tailored to meet site-specific needs. The curriculum also provides a vehicle to share information concerning EWP, enabling development of consistent, defensible performance indicators and sharing of lessons learned.

The curriculum is designed for both DOE and contractor personnel. Consisting of three courses and a team training "toolbox," courses may be used separately or in combination for the various groups involved with EWP at DOE sites.

Courses One and Two, "Introduction to EWP" and "EWP Fundamentals," are video-based presentations. Designed to educate a broad audience on EWP and as an introduction to the implementation training, the videos are currently in production, and filming is taking place at three DOE sites and at Headquarters. The video will debut at the National EWP Workshop in August.

Course Three and the Team Training Toolbox are designed to teach an EWP Core Team how to actually implement the EWP process at their site. The team works together throughout the 8-hour workshop on case studies and actual work processes that prepare them to enhance work processes at their own site. Valuable information about communication tools, team building, and lessons learned across the complex is also shared. This training has been given to the EWP Steering Committee, the

Rocky Flats Sitewide Core Team, and the INEEL Sitewide Core Team.

Key elements of Course Three include history, purpose, and scope of EWP; methods for overcoming resistance to change and gaining support for EWP; five key elements for successful implementation; sample steps for implementing EWP; work products, processes, and tools available from other facilities and how they can be used; documentation and communication of successes and failures complexwide; resource requirements and commitments needed for successful EWP implementation; and performance measures and return on investment as applied to EWP.

The Team Training Toolbox provides “hands-on” skills training in the effective formation and use of teams, a key concept of EWP. Key elements of the course include the use of teams in the EWP process; the criteria for selecting the “right” team and mix of team members; the roles and responsibilities of EWP team members; the design of effective EWP teams given various work management processes; the management of a team to plan work efficiently; the use of team skills to brainstorm, build a consensus, and manage conflict; practical communication methods effective for the needs of EWP; and the use of team self-assessment to improve processes and share lessons learned.Ē

WORK PLANNING AND CONTROL

IDAHO

During the second quarter, the Idaho Operations Office and its management and operating contractor continued their efforts to expand EWP efforts across the entire INEEL site. To expand EWP to all site facilities, INEEL management established an INEEL Sitewide EWP Directorate Steering Committee. Com-

posed of management from the DOE Field Office, Site Services, Nuclear Operations, Environmental Management, Waste Operations, Projects and Construction, TAN/SMC Operations, and Advanced Engineering Development Laboratories, the committee provided direction and assistance in EWP implementation. The mission of the EWP Directorate Steering Committee is to provide sitewide coordination and assistance for expansion of the EWP process. To accomplish its mission, the Committee is supported by a sitewide Working Team with working-level representatives from all facilities and major organizational functions.

As one of its first acts, the Idaho Steering Committee approved the consolidation of the Sitewide EWP Working Team with the Compliance Reengineering Maintenance Team, reducing duplicative efforts and combining resources to address common objectives. The objectives and approach of the two activities overlapped and provided a unique opportunity to integrate functions. The initial Sitewide EWP Working Team, for example, was a multifunctional team chartered to review and recommend actions for improving productivity and safety through improved work planning and by successfully integrating changes into the site’s work management systems.

The Compliance Reengineering Maintenance Team was established to streamline the preventive and corrective maintenance process, eliminate redundant or non-value-added procedures, simplify existing procedures, bring the ratio of support staff to workers in line with industry standards, and use matrix and contract support for nonroutine tasks where practical. EWP and Compliance Reengineering complement each other by focusing on different aspects of performing work safely and efficiently. EWP focuses on work control and job planning while Compliance Reengi-

neering activities center on reliability, availability, and efficiency. Both consider the graded approach and the use of performance indicators as key elements to understanding and improving performance.

Because both efforts were focused on achieving the same goal (i.e., improved worker safety and productivity, improved cost effectiveness, more effective planning input from quality, safety, and health professionals), the EWP Directorate Steering Committee agreed to combine the two initiatives under the EWP banner, with a single leader. With its integration with the Compliance Reengineering Team, the EWP Working Team now includes increased operations personnel and greater craft and technician worker involvement.

One of the first acts of the expanded EWP Working Team was to receive management endorsement for a standardized work control process at all site facilities and organizations. Standardization, the team feels, will improve safety and efficiency, provide greater flexibility for resource use across facilities, support matrix management and projectization, and simplify training requirements. The EWP Working Team defined the essential elements of the standardized work control system: (1) a common procedure with identical work control forms; (2) common terminology, roles, and responsibilities for work control participants; (3) identical computerized maintenance management and scheduling systems; (4) a single site priority rating system; and (5) a common hazard identification tool.

The first major accomplishment by the Site-wide EWP Working Team was resolving work control issues identified in the contractor's Integrated Safety Plan. The safety action plan issues include work order ownership, prework reviews, team reviews, value-added signoffs, safely making field changes, removal of unnec-

essary boilerplate information, and criteria for final work package approval. These issues have been fully resolved and implemented into facility-specific processes by the EWP Working Team through a revision to the INEEL sitewide maintenance procedure and a new management control procedure that standardizes requirements for prejob briefings. Training requirements concerning the changes in the work control practices are reinforced through the development of a short video, which discusses the changes and their impact on employees and communicates the sitewide EWP activities.

Another safety improvement action item addressed by the EWP Working Team is prejob briefing. Two site facilities have developed separate procedures for prejob briefings. Representatives from the now-disbanded INEEL Conduct of Operations Committee offered assistance to the EWP Working Team in standardizing sitewide practices for determining when informal briefings are acceptable and when formal, structured prejob briefings are required. The existing facility-specific procedures were reviewed and used to develop the sitewide guidance, now completed and added to the Operations manual.

The EWP Working Team recognized that including team reviews in the sitewide work control process ensures that individuals from all the functions, including craft workers, add value to the planning of a work package. The team undertook activities to involve workers on the work planning team as an effective means of using worker experience for identifying work hazards, improving work efficiency, and eliminating unnecessary requirements. Worker involvement during planning activities, including walking down the job at the work location, is effective since these employees know the equipment and understand the job hazards. In addition, team review and ap-

proval on high-complexity, high-risk jobs will expedite reviews, eliminating sequential reviews. The work control procedure will establish a formal process to determine when a team review is needed and specify the make-up of the team based on the complexity and risk of the job.

Employee involvement in the EWP process is essential for its success. To this end, INEEL EWP team member conducted two separate workshops. The first, a sitewide EWP Workshop held June 2–3, 1997, introduced the principles and benefits of active employee participation. The second presentation made at the EWP Tools Team Workshop held June 30–July 2, 1997, offered information to help the Team identify methods of involving employees in the actual implementation of EWP and to prepare organizations and individuals who will participate in team planning and review to work more effectively as a team.Ē

OHIO (FERNALD)

The Fluor Daniel Fernald EWP Department has successfully completed installation and testing of Fernald’s new Automated Worker Exposure Reporting System. The system, designed for the Medical Department, provides information on workers, the nature of work they have performed, the applicable permits under which the work was accomplished, and any resulting exposures to hazardous materials. This program has resulted in a 50 percent reduction in the time required to search through employee exposure records and has resulted in a simplified exposure report that is used by the Medical Department and shared with each worker at the time of his/her scheduled annual or “as-required” physical examination.

The Fluor Daniel Waste Programs Division implemented a new Waste Programs Task

Order procedure as a result of EWP Core Team efforts to evaluate and improve the manner in which task orders are requested, reviewed, approved, and executed. This procedure incorporates worker involvement in the early stages of work planning and clearly establishes a self-assessment mechanism for continuous improvement for waste management activities. As a direct result of implementing this new waste management work process, a 70 percent reduction in the time for requesting, planning, reviewing, and approving work has been realized, a 66 percent reduction in the time it takes to execute task order work has been achieved, and a 100 percent improvement in the review of task orders by the Fernald Health and Safety Department has been accomplished.

The Waste Programs Management organization now issues regular task order schedules as a result of the EWP Program at Fernald. Issuance of the weekly task order schedule enables support organizations to have advance notice of pending work, allowing them time to allocate resources in support of work activities. As a direct result of these schedules, an immediate 25 percent reduction in delays associated with support organizations showing up at the job sites was realized.

The export and cross-pollination of EWP successes from Fluor Daniel Fernald to other sites has continued. The Fernald EWP Department Manager, along with EWP Team members, hosted representatives from the Rocky Flats Environmental Technology Site (RFETS) to discuss, share, and demonstrate Fernald’s EWP successes in the maintenance area. The RFETS representatives were provided information on Fernald’s new Automated Work Package, use of equipment tags, and deployment of the maintenance “help line.” RFETS is now reviewing the information received. Currently, there are high expect-

tations that use of equipment tags and implementation of a maintenance “help line” at RFETS will be in place in the near future.

Significant progress has been made on growth and expansion of EWP across the Fernald site, including endorsement and support by the Fernald Environmental Management Project (FEMP). This progress has been demonstrated through (1) establishment of an EWP Site Advisory Team, including FEMP representatives, a representative from the Fluor Daniel Office of the President, and the EWP Department Manager, for the purpose of sitewide implementation of EWP; (2) orientation training of the EWP Site Advisory Team by the EWP Department Manager in the principles of EWP and its sitewide implementation; (3) applying EWP concepts for the successful implementation of improvements to Fernald’s Waste Programs planning process; (4) direction from FEMP to revise and issue Fernald’s Sitewide Implementation Plan, which formally established the EWP Site Advisory Team; (5) establishment of another new EWP Core Team in the Waste Programs, Waste Storage area to improve that organization’s work planning processes; and (6) formation of a nonproject EWP Core Team to evaluate work processes within the site’s landlord services area.É

OHIO (MOUND)

As a result of Mound EWP Maintenance Scheduling Compliance Team efforts, significant progress has been made on improving the efficiency of moving Environmental Restoration waste packages on site. The movement of these packages involves the coordinated efforts of several groups at Mound. Environmental Restoration compliance schedules, which are an indication of how well projected schedules are being met by all support groups, have steadily improved during this quarter, increasing from an average of 84

percent of moves being successfully completed in May to an average of 95 percent of moves successfully completed in June. A 100 percent success rate was achieved during the first week of July.

The Mound Maintenance Scheduling Compliance effort continues to achieve improved efficiencies with respect to scheduling maintenance work in tritium facilities and with respect to the movement of waste packages across the site. As a measure of these improved efficiencies, an additional combined total of \$108,000 in program costs was able to be applied during the quarter.

Enhanced Work Planning efforts have continued within the Waste Management organization, including those directed to the development of a Waste Permit process. The Waste Permit, when fully implemented, is to eliminate the generation of legacy wastes in the future. During the quarter, a Waste Permit pilot project was initiated using laboratory wastes. As a result of that pilot, there have been zero rejects of “step-off pad” laboratory waste packages. Moreover, workers have been actively involved in this pilot Waste Permit project. Through their input, clear plastic low-specific-activity waste liners are now being used for laboratory “trash” so that bag contents can be checked for improper materials and objects prior to insertion in the final shipping package. As a result, there have been no laboratory “trash” waste packages rejected to date.

As a result of applying EWP principles continuously through the use of pocket cards to identify causes for work being delayed in the R/SW/T Building areas, improvements in work efficiency have been realized. This past February the use of these cards indicated that “finding materials” for the job site was a primary cause for delays in performing work. A recent

pocket card resurvey completed in June indicated that more than a 50 percent improvement had been achieved with respect to job delays attributable to “finding materials.” As a result of the use of these cards, management has taken action leading to specific improvements, namely, consolidation of spare parts and relocating materials adjacent to the area planner.

Evidence continues to surface that the culture of managing work at Mound is continuing to change toward the involvement of workers as a regular practice in solving problems. Most recently, due to a number of problems involving respiratory protection equipment, a management review, facilitated as an EWP process, was conducted with hourly workers who use such equipment regularly. As a result of this initial meeting, several issues were identified, and a second meeting with workers was held to expand and address respiratory protection equipment issues at the site.

The Environmental Restoration Reengineering Team continued to pursue reducing the process review time for completion of environmental restoration project packages. The present process includes numerous serial reviews and approvals from various DOE and EG&G organizations. EG&G EWP personnel, working with the Reengineering Team, have established a multidisciplinary team to identify methods for improving project package preparation and completion efficiencies. The SW Cave project, involving the removal of radiologically contaminated fumehoods and equipment, was used as a pilot for demonstrating an improved process for project preparation. Using input from the team and parallel reviews and approvals, the duration of the SW Cave project was reduced by 16 percent.

Commitment by OH, the Mound Environmental Management Project (MEMP), and EG&G

to the support and expansion of EWP at Mound continued this quarter. An EWP Advisory Council was formed to provide guidance and direction for continuing the expansion of EWP throughout all Mound work activities. Two EG&G personnel and the MEMP Facility Representative Team Leader are scheduled to attend the Train-the-Trainer EWP course in Idaho Falls in August. Qualification of the MEMP Facility Representative Team Leader as an EWP trainer will assist MEMP’s move to projectize site office activities.

Representatives from OH, MEMP, EG&G, the Oil, Chemical and Atomic Workers Union, and one of the Mound EH technical assistants will attend the EWP conference in Idaho Falls to gain further insights on how EWP can be more widely implemented across Mound.Ē

OAK RIDGE

Enhanced Work Planning activities at Oak Ridge during the second quarter have resulted in significant work control efficiencies and cost savings. In addition, the EWP program has begun to contribute to key improvements in the site’s safety management systems and hazard analysis protocols at both the Y-12 Plant and the East Tennessee Technology Park (formerly K-25 Site). High-level Environmental Management site endorsement has resulted in the commitment to launch complementary EWP initiatives at Environmental Management Enrichment Facilities at Portsmouth and Paducah. Oak Ridge’s EWP Program is also being used as an integral part of the site’s strategies to fully adopt an Integrated Safety Management System to implement Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 95-2. Furthermore, Oak Ridge EWP is heavily involved in the implementation of important work control improvements identified through the Type A

investigation of an on-the-job fatality that occurred in February 1997.

During the second quarter, Oak Ridge organizations continued to set up their EWP programs and establish various EWP core teams to baseline work control processes, identify opportunities for enhancements, and implement beneficial changes. In particular, support has focused on helping EWP teams develop “strawman” policies, procedures, and guidance documents related to developing a generic approach to defining the optimum level of work control rigor based on hazard and complexity assessments. Various organizational groups and EWP teams coordinated their EWP efforts to refine strawman documents and other work products so that, where possible, consensus could be built leading to a more consistent and defensible work control process at both East Tennessee Technology Park and Y-12.

Second quarter 1997 saw EWP play a key role in removing work control bottlenecks and improving the efficiency of planning and implementing maintenance jobs within Enriched Uranium Operations at Y-12. Enriched Uranium Operations, and in particular the successful restart of more than 100 processes in the 9212 Complex, is the highest priority mission of Y-12. Faced with predictions of potentially serious cost overruns and schedule delays, the Y-12 EWP team focused on improving critical maintenance work control processes associated with this mission. Based on EWP meetings where a cross section of disciplines involved in the restart work control processes was represented (e.g., craft, planners, customers, safety and health experts), a number of serious impediments to the effective completion of work at the 9212 Complex were identified. It became apparent that work control systems used elsewhere in the Y-12 Plant to safely and expeditiously process work were

not being used because of the increased requirements of formality and rigor for all work associated with the restart operations. In particular, stringent requirements for tracking and closing out maintenance jobs while linking them to specific deficiency reports resulted in the elimination of the Y-12 Standardized Work Package system in the 9212 restart effort. As a result, every maintenance job, regardless of level of complexity, necessitated its own work request and detailed planning.

Over the last several months, the EWP Team worked together to enhance and reinstitute a Standardized Work Package process for the 9212 Complex. This process has already reaped great dividends for the Restart effort.

Clarifications and enhancements were made to the system to allow many jobs to be linked together based on logical criteria (e.g., same craft, same system or process, same piece of equipment). Now, once the jobs are placed in appropriate “bins” (and assuming a variety of criteria are met, ensuring that highly hazardous or complex jobs are excluded from the binning process), the collection of jobs can be planned and processed together rather than separately. The EWP Team ensured that all applicable requirements such as job tracking and closeout were being satisfactorily met by the enhanced system and that the existing Y-12 maintenance computer system was used effectively.

Since this standardized work package system was reinstated within the 9212 Complex in May, more than 200 jobs that would otherwise have been planned separately have been planned within one of five standardized work package “bins.” The economy of scale associated with binning as many as 50 similar, low-hazard/low-complexity jobs has resulted in the planning time being reduced to well under one-quarter of what it would otherwise have been (i.e., from 1–2 hours planning for each job to about 15 minutes). Planners can now devote

more time to the unique details of the jobs within the bins instead of dwelling on assembling paperwork, which provides little value to the worker or the overall work control process.

Another high-visibility success for EWP at the 9212 Restart effort likewise stemmed from using the EWP process to identify and resolve work control problems through the collaboration of a multidisciplinary team of involved stakeholders. Specifically, the EWP Team determined that great efficiencies and savings could result if more jobs could legitimately be changed from those requiring full planning to those requiring less rigorous planning (e.g., “minor maintenance”). It was determined that many planning and work execution bottlenecks could be avoided without jeopardizing safety or necessary organizational controls if greater reliance were placed on the skill of the worker and supervisor and an up-front communication between those involved with planning the work. In June, the Y-12 EWP Team began piloting within the 9212 Restart operations an enhanced work control process whereby new criteria were used for determining whether planners must generate a fully planned package versus allowing the job to be planned less rigorously as minor maintenance.

Streamlining the up-front communication between planners and configuration control and industrial safety experts (so that it can be determined whether a full-blown work package really needs to be created) could reduce the number of fully planned packages in the 9212 Complex by about 90 percent from about 30 fully planned packages per month to fewer than 5. In general, a fully planned package requires anywhere from several hours to more than a week to plan, whereas a minor maintenance job can typically be planned in a half-hour or less. Thus, the legitimate and defensible reduction in the number of fully planned

maintenance packages promises to increase efficiencies of the planning process dramatically and allow the planners to devote their time to those jobs most needing it.

Aside from Enriched Uranium Operations and the 9212 Restart project, separate but related EWP efforts continued at the East Tennessee Technology Park and within the corporate offices of the management and operating contractor. These efforts dealt primarily with enhancing the hazard analysis component of work control. EWP Teams continued to refine and expand the Work Planning & Permit Information System and developed a strategic plan that shows how the system can be used by work initiators; approvers; planners; environment, safety, and health organizations; and craft to enhance the entire East Tennessee Technology Park work control process. The Work Planning & Permit Information system, a computerized tool used to help identify hazards and requirements for a job or task being planned, is a cost-effective means to develop a documented and technically complete work package that incorporates all necessary health, safety, and environmental plans, permits, and procedures properly. The system provides detailed guidance to the user about when a permit is to be used and how various fields within the permit should be completed. Also, the system is used to apply policies dealing with determining the necessary degree of work control rigor (e.g., planning levels, degree of supervision, hazard assessment mechanisms) consistently per a defensible, graded, risk-based approach.

Designed by the EWP Team at Oak Ridge, the Work Planning & Permit Information system is currently being evaluated as a means to initiate and plan jobs within a number of organizational groups at East Tennessee Technology Park, including maintenance, engineering, operations, construction, and surveillance and

maintenance. The system is now linked to a variety of site databases, enabling extensive interchange of information. Specifically, hyperlinks are being established between the Work Planning & Permit Information system and informational systems, including the site's Maintenance Distribution/Job Request system, the facility/building manager database, the Standardized Work Package database, the equipment inventory database, the lessons learned database, the East Tennessee Technology Park Facility Safety Documents and Hazards database, and the East Tennessee Technology Park Radiation Work Permit system. The Work Planning and Permit system questions now point the user to more than 60 permits and requirements covering a diverse list of the technical areas.

A generic matrix that will be applied to all planning efforts across Y-12 and East Tennessee Technology Park (including operational work, maintenance work, and surveillance and maintenance of safety-significant systems and construction and subcontracted work), provides important guidance for determining the level of planning and work control based on a job's hazard and complexity. The matrix was developed by EWP teams.

While the implementing mechanisms for the Work Control Matrix concepts will be slightly different for the various Oak Ridge organizations involved (e.g., Enriched Uranium Operations; Disassembly and Assembly; Quality Evaluation; Receipt, Storage and Shipment; Environmental Management Enrichment Facilities), each organization's enhanced hazard assessment/work control system will be consistent within the generic approach identified in the matrix and its supporting rationale.

The Work Control Matrix will be piloted by the East Tennessee Technology Park Safe Work Planning Group. This group is a com-

mittee established to implement corrective actions identified as a result of the recent fatality as well as to ensure immediate improvement in planning and hazard analysis associated with all work logged onto the site's Daily Activities List. The matrix is being incorporated into the contractor's "Safe Work Controls" procedure, which will govern all work at Enriched Uranium Operations and Enrichment Facilities at Y-12, East Tennessee Technology Park, Portsmouth, and Paducah. E

ROCKY FLATS

At the Rocky Flats Environmental Technology Site, the Department of Energy Rocky Flats Field Office (RF), Kaiser-Hill, Safe Sites of Colorado (SSOC) and Rocky Mountain Remediation Services (RMRS), with support from EH technical assistance personnel, are conducting a cooperative effort to improve worker safety and productivity in all phases of work planning and execution that includes personnel involvement, ownership, efficiency, and productivity. SSOC and RMRS have each assigned a full-time program manager to guide the implementation of work control improvements using EWP principles.

The RFETS EWP program was conceived to provide a safer, more efficient work environment through the incorporation of basic EWP principles. The principles employed at RFETS encompass encouraging worker participation in the initial work planning process. This results in an enhancement of worker safety and work efficiency. Improving worker knowledge of safety requirements and involving these workers in prejob walkdowns helps to ensure that effective job hazard analysis is performed for each work project and assist in identifying appropriate hazard controls for the job.

The program stresses the fostering of teamwork between the workers and management personnel, which results in improving the technical accuracy and workability of work packages. Balancing the degree of work instruction, skill of craft, and work site supervision brings about a reduction in the overall time to plan, review, and approve work packages has begun to materialize. The program has emphasized the promotion of realistic, resource-loaded schedules, which has resulted in the enhancement of job coordination and efficient execution of the work. Continuous program improvement will be brought about by a real-time worker information feedback program.

These goals are measured using an Employee Feedback Survey and data retrieved from the work process. As outlined in the EWP Pilot Instruction, all projects described in this update have initial baseline data for their respective performance indicators. Additional performance indicators are being considered for quantitative measurements, as appropriate for each specific program. Also under development are indicators that show the correlation between the five key elements of the DNFSB work control process and the performance indicators of this EWP program.

The performance indicators are the feedback mechanism of the RFETS EWP program. Since this feedback is an integral part of an effective work control process, the SSOC and the RMRS EWP Program Managers are also participating in a sitewide self-assessment pilot initiative.

RFETS' first step to achieving these enhancements was to form a Process Development and Improvement Team, an organizationally diverse, multidisciplinary team charged with developing improvements to the RFETS work control planning process, evaluating suggestions from various work teams, and

integrating Work Smart Standards. A charter for the team will be approved by senior management and has the concurrence of the work control process owner. In addition, the team members have received training in the principles of EWP.

The Process Development and Improvement Team (PDIT) has been working with the RFETS reengineering team to evaluate non-routine maintenance activities. For example, the reengineering team, in its analysis of the current site work control process, showed that nonroutine maintenance jobs require 168 calendar days, 19 handoffs, and 41 different approvals to complete. The analysis revealed that only 10 to 13 days are actual craft labor time. One of the major objectives of the team is to develop process improvements targeted at reducing what appears to be excessive planning and approval time for this type of maintenance activity.

The PDIT interfaces with various Working Teams (WTs) throughout the plant site. The main functions of the WT's within the framework of EWP are to identify problems that exist with the work control process and to communicate this information to the PDIT. Also the WT's pilot the enhancements developed by the PDIT prior to implementation across the plant site. The WT's objective to date has been to pilot the Job Hazard Analysis (JHA) tool developed by the PDIT using key elements of EWP, such as a graded approach based on risk and complexity, worker involvement at the earliest phase of planning, and organizationally diverse teams. The following is a brief synopsis of the projects where EWP principles are being employed.

A joint SSOC and RMRS project WT has been formed in Building 374 to process approximately 4,500 gallons of laboratory liquid wastes. During this first EWP WT meeting, a

multidisciplinary subteam was formed to develop a draft project scope for this project. The tasks of this team included developing the task list for the required project activities, providing the sequencing for these tasks to be performed, developing options for accomplishing the project, and identifying other issues that may require resolution. These tasks were accomplished successfully. Incorporating the results from this effort, the Working Team will develop the detailed work plans, schedules, and resources.

RMRS has initiated an EWP pilot for the safe shutdown of the 444 Building cluster project. The 444 Cluster Buildings are manufacturing buildings previously used to process beryllium and depleted uranium. This project will put these buildings in a safe, shutdown configuration so they can be completely closed and require only a yearly inspection. In order to shut down the buildings, combustibles will be removed, loose contamination stabilized, and all utilities shut off. Similar to the Building 374 project, the 444 Cluster project has also formed a WT to define the tasks required to complete the project.

SSOC has initiated an EWP pilot for the Building 886 deactivation to be completed by September 30, 1997. The project requested the support of EWP to complete its schedule on time and safely. A WT has been formed for removal of utilities from the glovebox and ventilation downdraft unit located in Room 103 and removal of the annular tank. Two walkdowns involving craft personnel have been conducted in support of these tasks. The walkdowns proved positive, with all parties providing good input to the WT. A job hazard analysis checklist was used and completed during the walkdowns and was viewed as a helpful tool by all participants.

An SSOC EWP pilot in Building 776 entails removing pencil tanks used for storage of glovebox machine oil. Prior to employing EWP principles, walkdowns were performed on this project and were viewed as satisfactory. However, a WT was formed to complete another walkdown using EWP principles. The WT walkdown proved successful because of the use of the JHA tool developed by the PDIT, and using the team approach with craft involvement. The WT identified discrepancies not identified during the prior walkdowns. Had these discrepancies not been identified, they would have had a significant negative impact on completing this project in a safe and timely manner.

Building 771, an SSOC former plutonium processing facility, is now being prepared for deactivation. The first EWP pilot for this facility is the Benelux Removal Project, which will remove shielding material (Benelux) from glovebox lines. The EWP WT walkdown was conducted and the outcome had mixed results.

Lessons were learned. For example, the PDIT recognized the need to develop a tool to identify when teams are required, the composition of the team, and proper coordination of team walkdowns.

RFETS is planning to formulate additional EWP teams to develop an automated job hazard analysis tool and evaluate work execution methods. These methods being explored encompass resource allocation, scheduling, job coordination, and pre- and postjob reviews. The plant is also integrating the EWP principles within the integrated safety management process description and implementation. EWP is viewed as a major steppingstone for integrated safety management validation by DOE.

PANTEX

Nearly a year has passed since Pantex began its EWP pilot project involving reconfiguration of DOE's fleet of Safe-Secure Railcars. EWP implementation at Pantex continues to mature, and three organizations currently support EWP teams. The Maintenance Department, which conducted the pilot project, has the most mature program and is now assembling EWP teams for a variety of projects. This organization has issued a policy stating that all new projects will be conducted using EWP principles. Waste Management has been working toward applying EWP principles to its existing legacy waste workdown teams to improve procedure development and approval cycles.

Much of the success of EWP at Pantex is directly related to the Railcar Reconfiguration Project. This project has been a model of success in bringing representatives from many organizations (both internal and external) together to address a number of significant logistical and safety issues. At the end of the second quarter of 1997, 23 of the 24 railcars have been through the reconfiguration process. The project is 40 percent under budget and is expected to be completed on or ahead of schedule. The effort has been mentioned favorably by DOE in Cost Plus Award Fee reviews, and the overall reconfiguration effort is receiving the 1997 DOE Team Quality Award.

The 12-84 Turnaround Project is Pantex's largest EWP effort to date. It includes five separate but related EWP teams focused on reducing the number of maintenance-related events that adversely affect production schedule or capability in Building 12-84. The teams are working toward improving reliability of the HVAC system, radiation alarm monitoring systems, humidity control, emergency lighting,

fire protection, and preventive and predictive maintenance. This overall effort is being sponsored by all the Facilities Operations Department managers and the Facility Manager/Assistant Facility Manager. Since the teams began work in January 1997, the number of maintenance events in Building 12-84 has been reduced by more than 40 percent, primarily due to improvements in the reliability of the radiation alarm monitoring systems.

When the facilities maintenance integration system was implemented in January 1997, the baseline cycle time for job orders related to environment, safety, and health was 41 days based on historical data. Since implementation of the facilities maintenance integration system, cycle time is down to 34 days, a 17 percent improvement. Maintenance cost savings and cost avoidances for the improvements already implemented are \$775,000 for fiscal years 1997, 1998, and 1999. This number will continue to grow in time, as many of the improvements identified by the team (such as modification of the HVAC system) are still under evaluation.

Since implementing a skill-of-the-craft system early in 1997, approximately 18 percent of all job orders are now being handled under a streamlined system. Although the industrial engineering analysis of associated improvements and cost savings has not been completed, preliminary information indicates that there has been an approximate 10 percent reduction in the overall job planning workload attributable to using the skill-of-the-craft system.

Another EWP-related effort is a study to change the emergency lighting configuration in the manufacturing areas to use lamps similar to those installed in the 12-84 radiation alarm system warning lights. The engineering evaluation for this proposal has been completed,

and approval has been obtained to change the configuration of these safety-related systems. In addition to achieving compliance with National Fire Protection Association requirements, the life-cycle cost avoidance for the lamp configuration change is conservatively estimated at \$280,000 per year.Ē

LOS ALAMOS

During the second quarter, Los Alamos National Laboratory (LANL) began institutional implementation of its new work control process, which has been codified in a Laboratory Implementing Requirements document, "Facility Management Work Control."

LANL is using EWP to leverage improvements in integrated work control. Through a core project team, LANL wrote two implementing requirements documents, one for control of facility work and one for hazards analysis and control applicable to facility work. The core project team includes the facility managers; Facilities, Safeguards, and Security Division (project leader); Environment, Safety and Health Division; and Computing, Information, and Communications Division. The work control implementing requirement was accepted by the DOE Los Alamos Area Office and will be the basis for future DOE assessments of performance.

The Laboratory Implementing Requirements document for control of all facility work addresses all aspects of work management from work request to work package closure. The document discusses work planning teams, use of a graded approach, and an extensive process for use of skill-of-the-craft. It breaks the entire workflow process into discrete flow-diagrammed elements, each of which is defined and characterized. For example, full descriptions are given for emergency, urgent, and routine work requests. Flexibility is allowed

for how work is requested and planned. Thus, work may be requested verbally, electronically, or in writing.

In response to the January 1996 accident, LANL management committed to implementing the institutional work control program described in the integrated safety management plan. As part of this action, a complementary off-ramp commitment is to self-assess the performance of each off-ramp implementation, including the work controls program.

LANL's captive work provider subcontractor measures its own internal performance, including that needed for award fee determinations. It keeps improving its knowledge of work management processes and how well the company is doing. Besides the classic maintenance measures, there are, for example, measures of rework, prevention of exposure to health hazards, safety deficiency identification and correction, conduct of work, and labor relations. The subcontractor negotiates with LANL each reporting period to improve the basis of measurements as it learns which ones are worthwhile. A proposal is being submitted to make the health exposure prevention indicator more objective (i.e., less reliant on human judgment).

EWP implementation set back cycle time for preventive maintenance almost threefold because of the time needed to perform hazard analyses, which have now been mandated. However, once these analyses are done, they can be reused next maintenance cycle, bringing the cycle time back down. This setback in cycle time is actually an indicator of progress in that it demonstrates that safety has become a real value, not to be sacrificed for schedule.

Other key cycle-time measures, which were not affected significantly by new hazard analysis procedures, look increasingly positive,

including the time from receipt of work request to initiation of work (down from 49 to 8 days), and time to complete actual work (down from 270 to 119 days for high-cost projects, and similar ratios for lower cost projects).

LANL's Audits and Assessments Division and Facilities, Safeguards, and Security Division closely coupled their self-assessments of the new work control program, resulting in a critical, comprehensive picture of how the program is performing.

The Los Alamos Area Office has been doing frequent mini-assessments of the work control program as it matures, using assessment guidance based on the Laboratory Implementing Requirement for work control. They are finding good correlation to the LANL Facilities, Safeguards, and Security Division's ongoing self-assessment findings.Ě

RICHLAND

The DOE Richland Operations Office (RL) and the Hanford contractor are developing an integrated safety management system in response to DNFSB Recommendation 95-2. The system will apply to all Hanford operations and will be a contractual obligation for the Hanford contractor and its subcontractors. The integrated safety management system is intended to integrate safety and work management fully. RL and the Hanford contractor are fully incorporating EWP elements into the ISMS, effectively establishing EWP as fundamental to safety and work management at Hanford.

In preparation for implementation, integrated safety management system team members have begun presenting and discussing the work management principles and expectations to the Hanford contractor, major subcontractors, and

enterprise company staffs. A presentation was made to Hanford contractor company presidents and executive staff, and continued support for the integrated safety management system and EWP principles was expressed. This was followed by presentations and discussions with the broader staffs from the various Hanford companies.

In concert with these presentations, the site integrating contractor is reviewing facility involvement to provide data for sitewide implementation of the integrated safety management system with full EWP incorporation. To that end, the site core team leader is concentrating on developing a "living document" to baseline each facility's involvement with EWP. The EWP improvement process will determine use of key EWP principles and tools, identification of enhancements, and concepts, all of which will be baselined to establish the status of each facility and the Hanford site as a whole.

In addition to elements and processes, many EWP tools will be incorporated into the integrated safety management system plan. One objective is to develop and use a single, comprehensive job hazard analysis process that is consistently applied during work planning. Hazard analysis, particularly the job hazard analysis process, has been a continuing deficiency at Hanford that has been cited in numerous reports, assessments, and investigations over the years. To solve this problem, the integrated safety management system calls for use of the automated job hazard analysis developed for EWP projects at Hanford.

Revision 2 of Hanford's automated job hazard analysis was introduced to seven test facilities in May 1997. These facilities are using the job hazard analysis system and providing detailed comment and feedback to optimize its content and application during work planning. In

particular, the automated job hazard analysis is intended to support implementation of EWP elements such as teamwork, risk- and complexity-based approaches, and worker involvement. The job hazard analysis is not to be used as a standalone tool in a current work management process that may be flawed. Instead, it is to be implemented within the integrated safety management system with EWP elements to enhance and optimize the work management process.

The implementation process for the integrated safety management system will involve baselining current work management processes and practices, identifying needed enhancements to meet integrated safety management system expectations, developing the modified and enhanced approach, implementing changes and enhancements, developing performance measures, and evaluating and refining the improvements through feedback, self-assessment, and lessons learned.

During this reporting period, Hanford celebrated a major milestone with completion of the deactivation of the PUREX facility. Dedication and hard work by PUREX personnel, along with the Hanford EWP field activities, have resulted in an outstanding success. In the words of John Wagoner, Manager of the DOE Richland Operation Office, "PUREX deactivation is an excellent example of the kind of smart, innovative, and efficient work we do at Hanford." PUREX implemented EWP in January 1996. On June 20, 1997, DOE Assistant Secretary for Environmental Management, Al Alm, participated in the celebration to commemorate completion of PUREX deactivation. Utilizing EWP principles, PUREX trimmed \$12 million from its budget, saving nearly \$76 million overall while completing the deactivation more than a year ahead of schedule. Mr. Wagoner continued to say, "We are sharing the innovative, cost-saving technique

and lessons learned on this project with other DOE sites."

B Plant and the Plutonium Finishing Plant (PFP) are next in line for deactivation. Lessons learned during the PUREX deactivation are being applied at these facilities. Preliminary observations by the site core team leader indicate that B Plant incorporates all key EWP elements into its work control process. By reducing hazards and applying lessons learned from PUREX, B Plant is on schedule to complete deactivation by September 1998. Since the June 1996 implementation, the average life cycle of work tasks (validation to completion) has decreased from 75.6 days to 32.3 days. PFP has started its implementation by concentrating on a formal maintenance schedule. Preliminary results indicate schedule achievement increasing to 70.5 percent in April 1997, a 100 percent improvement since its inception.

The Plutonium Finishing Plant—the current standard-bearer for EWP at Richland—has established quarterly maintenance goals, based on completing an agreed-to number of maintenance work packages, on or ahead of schedule. Maintenance is now no longer competing with PFP transition and decommissioning work. Maintenance work, for the first time, is receiving the same degree of management attention as other fee-based work. The result has been a marked increase in the level of management and supervisory involvement at the maintenance team planning and scheduling level, as well as increased involvement of the crafts in preplanning, planning, and performing work. Maintenance schedule performance has improved dramatically since the inception of a formal schedule and, to date, performance incentive goals have been met or exceeded.

With the advent of a formal schedule, the increased involvement by management, and the increased visibility of problems encountered in

the field afforded by periodic schedule review meetings, PFP management evaluated the effectiveness of maintenance persons-in-charge. (Persons-in-charge are primarily responsible for supervising field work and ensuring that work is performed safely, on schedule, and in compliance with approved procedures.) Several efforts were initiated to strengthen and reinforce the role of persons-in-charge, including development of functional position descriptions; preparation of an administrative procedure to reflect person-in-charge responsibilities; and development of a training module expressly designed for maintenance persons-in-charge.

The training module emphasizes the responsibilities, authority, and accountability aspects of the job. In addition, PFP conducted a 2-hour training session directly with department persons-in-charge that emphasized their critical role, making it clear that they act with the authority delegated to them by management and that they will be held accountable for performance. The degree of management involvement, coaching, and effort to enrich the performance of maintenance persons-in-charge is the direct result of enhanced work management initiatives. The management team is continuing to emphasize the need to identify opportunities for improvement at the team level.

One of PFP's enhancements to the work control process was assigning radiological control technicians directly to the maintenance teams, and allowing them to be shifted among teams, based on changes in workload, at the discretion of team leaders. The result has been an improvement in use of radiological control technicians, increased job-specific knowledge by both the technicians and the crafts, and an increased awareness of the importance of communication and teamwork in planning and scheduling work. Maintenance and radiologi-

cal control management developed a memorandum of understanding to ensure joint cooperation, and results to date have been encouraging. Radiological control managers now also attend maintenance schedule review meetings and participate in the work management decision process, significantly enhancing communications.

The May 14, 1997, accident at the Plutonium Reclamation Facility has had a major impact on PFP. Resources have been diverted to the recovery effort and maintenance activities have had to be adjusted accordingly. However, the experience gained in developing and implementing the maintenance activities schedule was directly applied in developing and implementing a recovery schedule for the Plutonium Reclamation Facility. In addition, a recovery work task identification, evaluation, and approval methodology was established to specifically address recovery work rather than the existing work modification and control system. The current challenge is to continue to support recovery efforts and simultaneously ensure that the momentum in planning, scheduling, and implementing maintenance work improvement is maintained.Ě

SAVANNAH RIVER

Building on the NMSP pilot project successes, the sitewide EWP waste minimization team met to plan a "path forward" for implementation of contaminated-area rollbacks sitewide. Studies by the team found that reducing the size of contamination and high-contamination areas could avoid the expenditure of \$50 million over 7 years, representing a 40:1 return on investment. Savannah River has more than 720,240 ft² of indoor contamination areas and 623,062 ft² outdoor contamination areas, and an analysis of 114 of these areas showed a potential \$18.3 million annual savings if these areas are rolled back. Reducing the size of

radiologically contaminated areas (1) eliminates a hazard and source of future radioactive, hazardous, and mixed waste requiring treatment, storage, or disposal; (2) decreases donning and doffing time for protective equipment (over 100,000 hours annually); and (3) decreases radiological exposures of Savannah River workers, consistent with ALARA principles. The sitewide EWP waste minimization team is using the economic-based prioritization model to prioritize facility rollbacks and establish economic performance measures. In addition, the Rollback Handbook will be revised to address the economic model and decontamination technologies. The handbook will continue to be used to facilitate institutionalization of the EWP-based rollback process.

Because of the success of the waste minimization pilot project, the Savannah River Site-wide Maintenance Reengineering Project was linked to the EWP Program this quarter. The reengineering effort focuses on four primary areas: implementation methods to streamline work control processes, scope and standardization definition for types and frequencies of maintenance activities, sitewide material management and procurement, and a computer maintenance management system for use in all site business areas.

Savannah River EWP team members are working with the maintenance reengineering team to evaluate opportunities to help improve integration of the work planning teams. The approach includes reviewing other SAVANNAH RIVER and DOE complex successes to identify good practices that could be applied to the maintenance reengineering pilot projects. As a first step, the team is reviewing the results high-performance work teams achieved through employee empowerment in the SAVANNAH RIVER Site Utilities Department Waste Water Treatment Operations Pilot Project.

Finally, an ad hoc team was recently formed to address the conduct of operations and work management interface between the management and operating contractor and subcontractor personnel on environmental remediation projects. This group consists of multidisciplinary, cross-functional participation from diverse organizations, including procurement, Industrial Hygiene, Radiological Controls, and Projects personnel from both the prime and subcontractor organizations. This group meets weekly to discuss division of responsibility (oversight vs. production), lines of communication, and work process control.

The Subcontractor Team is evaluating subcontractor performance trends, occurrences at other DOE facilities, and field issues at Savannah River to achieve work process and communication improvements in the subcontractor interface. The goal is to improve safety performance continuously through enhancements to conduct of operations, communications between prime and subcontractor management, and clarified roles and responsibilities.Ē

RADIOLOGICAL CONTROLS

OHIO

During the first quarter, the Fernald Environmental Management Project issued its final report on Radiological Control Optimization. The DOE Fernald Area Office Radiological Control Manager and the Director, Radiological Protection, presented the study's results at the annual meeting of commercial nuclear power plant Radiological Protection Managers, sponsored by the Nuclear Energy Institute. This briefing was well received by these managers, as many of them face challenges similar to those evaluated in the study.

In addition, EH technical specialists assisted in preliminary planning for the Electric Power

Research Institute-sponsored study of worker efficiency and physiological stress associated with wearing personal protective equipment and respiratory protection at the Fernald site.

EH technical specialists also assisted Mound staff members in a review of contamination control practices related to an event involving multiple shoe contaminations during remediation activities in site soil contamination areas. Observations and opportunities for fostering continuing improvement were discussed with management of the Ohio Field Office, the DOE Miamisburg Area Office, and the contractor. While at Mound, an EH Technical Specialist participated in the second quarter meeting of the Ohio Radiological Forum, which focused on radiological optimization and radiological program indicators. The meeting provided an opportunity to discuss radiological performance indicators at several other DOE sites.Ě

ROCKY FLATS

During this quarter, EH technical specialists assisted the Rocky Flats Environmental Technology Site in conduct of operations, radiological controls, and control of work. Two courses in excellence in operations were conducted for contractor personnel. These courses included instruction on inspection techniques and sessions in site facilities under the tutelage of field instructors. During the next quarter, the findings and observations from these field exercises will be used in mentoring and coaching individuals who manage the facilities and supervise the work crews. This will provide a direct interface with current efforts directed at use of integrated facility and activity schedules; supervision of jobs, activities, and workers; and preparation of resource-loaded work schedules. These efforts directly support ongoing EWP demonstration projects and new initiatives to improve self-assessment.

As part of efforts to improve site efficiency, one of the site contractors has increased the quality and integration of its plan-of-the-day and scheduling processes. Late in the second quarter, schedules were developed for management of the critical resource that tends to control all site schedules—the radiological control technicians (RCTs). Daily work assignments by individual increased control of work for about half of the RCTs, specifically those supporting the remediation contractor.

Significant improvements are also expected in RCT utilization as a result of another initiative started late in the second quarter. A review of the requirements specified in Radiological Work Permits (RWPs), and specifically the degree of personnel protective equipment and the amount of RCT coverage prescribed for the job or task was performed to identify possible improvement opportunities.

The first issue related to the control of PPE in the total scope of personnel safety (e.g., allowing personnel to wear respirators or additional PPE clothing when the risk of heat stress decreases worker safety). The second issue concerns the RCT coverage specified in RWPs. In many cases, line management's dependence on RCTs and their allowing RCTs to specify the coverage have resulted in less than efficient use of valuable RCT resources. Reviews and revision of RWPs by line management, radiological engineers, RCTs, and the Radiological Control foreman have commenced.

A future radiological program review was arranged for the third quarter, with participation of EH technical specialists and as part of cross-pollination of radiological practices.Ě

RICHLAND

Technical Assistance continued to be provided to the Richland Training Organization in sup-

port of Radiological Control training classes for DOE technical, program, and project personnel. When completed in mid-July, this training will have been given to approximately 180 personnel. It has been very successful and has proven to be quite useful to DOE personnel who direct and monitor radiological work performed by contractors. This training addresses many of the fundamental technical competency issues raised by the Defense Nuclear Facilities Safety Board in the area of radiological controls.

Technical Assistance has now shifted to helping RL develop a continuing training program to sustain the competencies gained through attending the initial training course. Industry experience has shown that continuing training is necessary to maintain an effective management team with the requisite working familiarity with radioactivity.

MEDICAL MONITORING/ SURVEILLANCE (RICHLAND)

Hanford's occupational health process, a key element of Hanford's EWP effort, represents a significant and fundamental change in DOE's approach to occupational health. The new process promotes a shift from an inefficient administrative approach to an optimized, risk-based approach. The overall objective of Hanford's occupational health process is to place employees in proper medical and training programs based on risk, and to implement feedback systems allowing prompt implementation of appropriate preventive measures.

This risk-based approach affords dramatic improvements in the quality, efficiency, and cost effectiveness of occupational health programs. Once information is compiled for each employee regarding hazards, exposures, physical requirements, and essential functions, employees are placed in proper medical and train-

ing programs, and medical examinations focus on risk.

The risk-based information is compiled for each employee using an automated employee job task analysis. When complete, these analyses are electronically forwarded to a medical database (the Risk Management Medical System) where decision logic is applied, and proper medical programs are chosen for each employee.

The Hanford occupational health process is being implemented for the entire Hanford workforce, including employees of all prime contractors, subcontractors, and the Richland Operations Office. This approach will achieve consistency and standardization of medical programs across the Hanford site. It will also ensure consistent quality of service whether the employee is a permanent Hanford employee or an employee of lower-tiered subcontractors, who often represent a more mobile workforce.

In the second quarter of 1997, RL, prime contractors, major subcontractors, and enterprise companies completed employee job task analyses for the Hanford workforce. The goal of the Hanford contractor was to complete 95 percent of employee job task analyses by June 30. This goal was surpassed, with virtually 100 percent of employee job task analyses complete. The environmental restoration contractor likewise completed employee job task analyses for all its employees.

With employee job task analyses complete, the revised regimen of medical examinations indicated for employees can be determined and proper medical programs can be implemented for employees based on risk. This enhanced system will be phased in over the next several months by scheduling employees for examination on a company-by-company basis. Once

employee job task analysis information undergoes a quality assurance check for a particular company, the new medical programs will be instituted.

Preliminary analysis of employee job task analysis information indicates that a substantial number of medical examinations that have historically been provided are not needed for many employees because they are not at risk. On the other hand, various employees were identified as needing certain examinations that they have not been receiving. The net result will be a significant reduction in the number of examinations, with simultaneous improvement in the quality of the medical examination process by focusing on risk and ensuring proper examinations for those at risk. These results are consistent with the results of the EWP demonstration project conducted at West Tank Farms and K Basins in 1996.

Many additional benefits were achieved through the employee job task analysis completion process. After taking the time to roll up information on the employee job task analyses, many managers, employees, and industrial hygienists expressed far greater awareness of job functions and risks, and a better understanding of the need for hazard control. They also expressed a clearer understanding of applicable requirements, such as when hazardous waste operations and emergency response (HAZWOPER) issues applied and when they did not. This led to removal of certain unnecessary, self-imposed requirements. As an example, HAZWOPER medical surveillance was removed as a blanket requirement at all facilities. The employee job task analyses will indicate, by employee, who needs this surveillance, instead of its being applied broadly to large workforces where in most cases exposures are not significant.

Employees also expressed a better understanding of why they were undergoing certain examinations. The employee job task analysis process also provided industrial hygienists with information to prioritize their exposure assessment programs.

Over the third quarter of calendar year 1997, the quality assurance review of the employee job task analyses will be conducted, and the new set of medical examinations will be phased in. The employee job task analysis will be revised and further improved based on feedback and lessons learned from the completion process. RL is developing an implementing directive for Hanford's occupational health process, and an advisory council is being formed to facilitate integration, maintenance, and continued improvement of Hanford's occupational health process. On completion of the implementing directive, lower-tiered subcontractors will be brought into the process. Other activities will include enhancing the medical programs and protocols indicated from the risk-based employee job task analysis process.Ě

LEADERSHIP TRAINING (RICHLAND)

The EH Online Leadership Development Program has completed its first year of activities at Hanford. Thirty-five individuals have completed the program and an additional 40 will complete it by the end of the fiscal year. The program continues to help professionals, supervisors, and managers in developing their leadership skills.

In the last quarterly report, results of a retention study for the pilot sessions at the Hanford Analytical Services Laboratory were discussed. Since then, two additional groups from the Plutonium Finishing Plant were surveyed to determine their retention of the information and behaviors learned 4 months after

completing the program. The results were consistent with those of the previous study: individuals indicated retention of skills and efficiency improvements realized from the development program.

Analysis of the survey data shows that participants continue to use and improve the skills they developed during the program and that the behavioral changes they made are sustained. Three-fourths of the individuals continue to make and strive toward personal improvement goals. All the participants indicate their leadership skills are stronger than before they participated in the program.

The Online Leadership Development Program has demonstrated that participants are more effective, efficient, and satisfied when they improve their communications and conflict-management skills. The success of the program relies on the participants maintaining ownership of new leadership behaviors learned. This ownership results in a high degree of personal commitment and continued growth even after the program has been completed.

Observations from the staff members show the impact the program has had on the management of the Plutonium Finishing Plant: "...managers exhibited a unified position on issues which arose, to a greater degree of participation than we have observed in the past and, as a whole, presented themselves as a team. Weekly Maintenance Schedule Status Meetings (on Fridays) have become much more businesslike and constructive, and management participants seem to be working more closely together as a team.... Public expressions of appreciation and recognition of a job well done are in evidence to a greater degree.... Managers appear to be reaching out to their peers and subordinates to assist in problem solving.... There is a marked decrease in

public displays of disrespect for one another at both the manager/peer level and manager/subordinate level.... Managers now appear to be discussing <our' problems together instead of <your' problems."

The success of the Online Leadership Development Program pilot at Hanford demonstrates the potential benefits that could be realized from applying this approach at other facilities. Currently, implementation of the Online Leadership Development Program is being considered at the Rocky Flats Environmental Technology Site, Idaho National Engineering and Environmental Laboratory, and Brookhaven National Laboratory in concert with the EH Self-Assessment Pilot Program.

SELF-ASSESSMENT

During the second quarter, EH technical specialists continued their work with personnel at five DOE sites testing a broad range of potential improvements in DOE's approach to self-assessment. Team members participated in a complexwide meeting in Denver to discuss the Department's proposed policy on line management's oversight of environment, safety, and health, which included extensive discussions of self-assessment as the basis for the new policy. In addition, EH supported efforts to form a new Standards Process Action Team (SPAT) to help define the attributes of effective self-assessment programs at Headquarters and in the field.

Significant progress was made in initiating field demonstration projects during the second quarter. Technical support plans have been drafted for projects at the Idaho National Engineering and Environmental Laboratory, the Rocky Flats Environmental Technology Site, the Lawrence Berkeley National Laboratory, Brookhaven National Laboratory, the Mound Plant, and the Fernald Environmental Manage-

ment Project. Efforts at these sites will encompass a broad range of self-assessment activities, including eliciting employee suggestions, managing information regarding potential improvements, improving communications between workers and management, and increasing worker involvement in self-assessment activities. Detailed information is provided below on the status of demonstration projects at each of these sites.

Self-assessment team members participated in a 2-day meeting to discuss the Department's draft policy on line oversight of environment, safety, and health. The new policy rests on the premise that contractors should develop and implement effective self-assessment programs and processes so that they can self-identify potential weaknesses as well as good practices. Effective self-assessment processes then provide a basis for decreasing the level of DOE oversight of the contractor, resulting in savings in resources both within DOE and within the contractor. During the meeting, an extensive breakout session was held to begin defining attributes of effective self-assessment programs based on results from a series of pilot projects conducted to study the potential effects of implementing the draft policy. EH self-assessment team members contributed to the discussion and shared results from the EH benchmarking study completed in 1996.

EH self-assessment team members also participated in initial efforts to form a new SPAT to help define attributes of effective self-assessment programs and processes. EH technical specialists participated in a conference call and two meetings aimed at establishing a charter and an initial schedule for the group's activities. The proposed charter was presented to and approved by the Department Standards Committee. Three separate task groups were established to study Headquarters, DOE field

element, and contractor self-assessment programs and processes.

In the second quarter, efforts continued to collect additional information on innovative self-assessment practices within the DOE complex that could be adapted at other DOE sites. EH self-assessment team members met with staff at the Stanford Linear Accelerator Center to discuss their Safety Discussion Program. This program was initiated in 1996 in response to a series of operational events and institutionalized in 1997 based on the success of the first effort. To implement the program, a group of facilitators is trained to lead small groups in discussing safety and performance issues. Each employee at the Center has the opportunity to participate in small-group discussions during a scheduled stand-down. Issues raised in each discussion are forwarded to line management for analysis and action, and resolution of the results from the meeting are tracked in the site's action tracking system. In 1997, more than 260 suggestions or issues were elicited through this process. A similar process at Fernald has provided input to management for improvement with promising results.Ē

IDAHO

Idaho is one of the key pilot sites in testing new approaches to self-assessment. The site's management and operating contractor has defined self-assessment, including essential elements, benefits of a positive self assessment program, critical success factors for effective self-assessment, and an implementation plan and schedule. The contractor management has selected the Radioactive Waste Management Complex (RWMC) as the appropriate organization to conduct the pilot.

At INEEL, self-assessment has been defined as an organization's self-administered process for

continuous improvement by identifying opportunities and implementing changes to increase efficiency, effectiveness, and safety. The essential elements to be incorporated in the INEEL pilot are an enhanced self-assessment process and procedures for both workers and managers, information processes and tools, and development of a positive self-assessment environment.

Self-assessment processes and procedures promote continuous improvement by all employees (line workers and managers) through identification of improvement opportunities and deficiencies to be corrected. These processes include activities such as employee suggestion programs, improvement incentive programs, employee concerns, postjob reviews and critiques, line management assessment activities, and management walkthroughs. The enhancement to these processes is aimed at ensuring that these programs are in place and effectively used.

Self-assessment process improvements will be identified through the contractor's line-management-led process improvement team. This multidisciplinary team includes operations, maintenance, and support organizations from RWMC environment, safety, and health support personnel, and representatives from the major INEEL facility organizations. The broad facility representation will expedite the transition from the pilot to sitewide application. In addition, plans for self-assessment training, supervisor/foreman involvement, and employee participation to achieve employee ownership of the program have been defined as part of the pilot demonstration.

The INEEL process improvement team will identify enhancements to the INEEL contractor's Issues Communication and Resolution Environment (ICARE) system electronic data management system to support self-assess-

ment. The ICARE system will allow individuals to identify improvement opportunities, communicate information with management, capture and track progress on actions, and communicate results throughout the organization. Improvements to the ICARE system to support the RWMC self-assessment pilot include changes to increase employee participation and management commitment. ICARE modules will be developed and implemented to facilitate improvement and innovation and lessons learned.

An early activity in the INEEL self-assessment pilot is to baseline current self-assessment processes. This activity has been accomplished through the development and use of an interview process with a broad range of personnel at many of the INEEL facilities and organizations. A series of self-assessment questions were added to the EWP survey of the existing status around the INEEL. These questions were asked of a broad cross section of line managers, supervisors, engineers, craftsmen, foremen, planners, and others. In general, the results from the interviews of INEEL employees indicated that the current self-assessment process related primarily to safety issues and auditing (assessment) by others within the groups.É

LAWRENCE BERKELEY NATIONAL LABORATORY

After a presentation at a meeting of the DOE Department Standards Committee by the Office of Worker Health and Safety in May, Lawrence Berkeley National Laboratory (LBNL) volunteered to participate in a pilot project to evaluate potential improvements in self-assessment programs and processes. The EH Technical Support Team visited LBNL in early June to gain an understanding of the current status of LBNL self-assessment efforts

and identify proposed enhancements for site self-assessment activities.

The initial site visit consisted of a series of presentations by EH personnel and roundtable discussions with the DOE Berkeley Site Office (BSO) and LBNL contractor site personnel responsible for self-assessment activities. After meeting with BSO management to define initial direction of the technical support effort, one-on-one conversations were held with LBNL personnel at selected facilities. The results of these preliminary meetings confirmed LBNL's willingness to participate in the self-assessment pilot initiative and provided a basis for defining some preliminary strategies for enhancing their self-assessment efforts.

An EH technical specialist worked with LBNL and BSO to gain additional information on site self-assessment programs currently being used and on current DOE improvement initiatives for operational awareness, to provide a basis for developing a draft technical support plan. Based on preliminary discussions, specific activities to support both BSO and LBNL were identified.

The BSO is currently redefining how contractor performance is verified. Though the approach hasn't been made final, BSO expects the program to use a performance-based approach, using the new performance measures being finalized for LBNL. The proposed program, entitled "Operational Awareness," will provide BSO personnel the opportunity to observe day-to-day activities of contractor personnel and gain a better understanding of how the contractor addresses programmatic requirements. It will include direction on conducting walkthroughs, surveillances, for-cause reviews, and the like. The Operational Awareness program criteria will use the Integrated Safety Management System (ISMS) core functional areas and supporting principles to focus

operational awareness activities.

In addition to enhancing awareness of contractor activities, another goal of the Operational Awareness program is to support development of the BSO Annual Report. This will be accomplished by using information gained during the fiscal year from the operational awareness program to reduce, or possibly eliminate, the traditional 2-week field appraisal. This would add value to site activities by reducing the impact on contractor activities during preparation of the BSO Annual Report.

Current safety and health assessment efforts by LBNL comprise three formal programs, Divisional Self-Assessment; Integrated Functional Appraisal; and Management Environment, Safety, and Health Appraisals. All these programs share common objectives: (1) provide a mechanism that allows facilities to compare actual operations to LBNL performance objectives; (2) ensure timely identification and correction of ES&H deficiencies; and (3) prevent recurrence of ES&H deficiencies. Each program approaches achieving the objectives in a slightly different fashion. Divisional self-assessments are conducted by Division "Safety Coordinators," who use walkthroughs, interviews, observations of work practices, and reviews of documentation to identify hazards that are not adequately controlled. The Safety Coordinators also work with researchers and Division personnel to enhance awareness for controlling work hazards, identify programmatic deficiencies, and note good practices. Attention is also given to monitoring for performance improvement opportunities.

Integrated Functional Appraisals (IFAs) are performed by LBNL personnel within the Environment, Health, and Safety Division. IFAs commonly focus on higher hazard, or more complex, operations. The IFA provides an independent review of the operation, since

Environment, Health, and Safety Division personnel, instead of personnel within a given division or laboratory, perform the activity.

Management environment, safety, and health (MESH) appraisals are conducted on a triennial basis and are coordinated by the site Safety Review Committee. The committee is composed of representatives from each division as well as the Deputy Director for Operations. The committee provides a peer review panel to assist in developing review protocols and evaluates progress of each division in closing corrective actions for findings generated from the appraisals.

Most divisions also conduct informal self-assessments during their day-to-day activities, although results from these efforts are not always documented. Initial discussions with LBNL personnel indicate that contractor self-assessment programs may benefit from establishing a method to document informal self-assessment activities in addition to enhancing functions of the safety coordinator meetings so that divisional self-assessment methods can be shared more effectively within the Laboratory.

Self-assessment improvement efforts will also focus on identifying methods to enhance current informal self-assessment activities; link self-assessment activities with LBNL performance measures and ISMS objectives; and promote worker involvement in self-assessment and productivity improvement activities. To aid in determining effectiveness of site activities, the EH technical support team will provide recommendations and tools to LBNL for measuring changes in worker attitudes regarding self-assessment. The EH technical specialist will also provide assistance in establishing a sitewide employee suggestion program, using the approach demonstrated in the employee suggestion program currently used by the Engineering Division.

Both BSO and LBNL personnel are enthusiastic about participating in the self-assessment pilot initiative and are very receptive to enhancing current self-assessment activities. Once completed, revisions to the LBNL self-assessment program should result in improved safety, increased employee participation, enhanced employee morale, and quantifiable cost savings.Ě

ROCKY FLATS

Since July of 1995, when the new Integrated Management Contract was implemented at the Rocky Flats Environmental Technology Site, Rocky Mountain Remediation Services has maintained the current site infrastructure while developing a company-specific infrastructure contingent on risk and the availability of resources and budgets. The inherited infrastructure did not include an effective self-assessment process. Although a program existed, it was not widely used and a champion for the program had not been assigned.

Within the past year, RMRS began to lay the groundwork to develop and implement an effective self-assessment program. RMRS conducted a preliminary review of current activities against the criteria and elements described in EH's benchmarking report on self-assessment. The evaluation indicated that several site infrastructure programs supported various criteria identified in the report, but that there was no continuity or focus to indicate that a specific self-assessment program was in place. RMRS will work with the integrating contractor and RF in developing and implementing a pilot self-assessment program.

RMRS will use a process improvement team to implement the self-assessment pilot program initiative. This core team will—

- < Define obstacles to implementation of an effective program and solicit sponsorship to eliminate impediments;
- < Evaluate the programs employed by RMRS and the RFETS Site that support effective self-evaluation;
- < Benchmark the available programs against comparable elements of other DOE sites and private industry;
- < Conduct a gap analysis and prioritization to determine what changes should be made to existing programs or what systems and tools should be developed and implemented to increase effective self evaluation;
- < Facilitate implementation and measurement of the self-assessment systems and tools;
- < Adjust systems and tools based on measured effectiveness;
- < Report the effectiveness of the pilot program; and
- < Assist the RFETS Site in broad application of the self-assessment tools and systems proven effective through the pilot program.

Over the course of the first two team meetings, performance indicators to measure effectiveness were established. The first indicators focused on obstacles to effective implementation of the program. The essential characteristics to be monitored included RMRS/Kaiser-Hill commitment, union commitment, senior management follow-through, financial commitment, and program follow-through. The team composition will continue to be refined and will ultimately include representations from all appropriate organizations to realize the objectives set for the program at the highest level within RMRS. Benchmarking activities to determine what systems and tools are currently available within RMRS operations and at the RFETS Site will continue in the next quarter. The effectiveness and availability of those elements will be compared to a benchmark of industry and DOE complex systems considered to be best in class.Ě

BROOKHAVEN NATIONAL LABORATORY

Brookhaven National Laboratory (BNL) has become an active and enthusiastic participant in the EH self-assessment pilot program. A strong self-assessment program is one of the cornerstones of BNL's internal improvement plan. A technical assistance plan has been prepared for support by EH mentors at BNL. The plan has received endorsement by BNL and DOE site management and EH and Office of Energy Research representatives. The plan has the following principal objectives: (1) developing a comprehensive description of all self-assessment activities currently performed at BNL, (2) enhancing current self-assessment activities, (3) expanding worker involvement in the self-assessment process, and (4) communicating successful BNL program attributes to other DOE organizations. These objectives will be achieved through reviews of current self-assessment programs, assisting in developing and/or implementing selected program enhancements and measuring overall effectiveness of the self-assessment program.

During this quarter, the BNL self-assessment improvement was assembled and the pilot project started. The team was carefully selected to be representative of a cross section of job functions at BNL, from management to worker, and including scientists. Additionally, a variety of departments are represented on the team. DOE Brookhaven Group is on the team, as well as a union member. Tools and information that EH has collected or developed at other sites is being used, as applicable (i.e., an EH mentor from DOE Headquarters provided self-assessment training to the team members). The self-assessment training was a fruitful exercise in that it helped the team members pull together and get "calibrated" on the same wavelength. We are currently baselining our self-assessment activities. This

baseline effort is being achieved through interviews and review of existing documentation.

In the next quarter, an implementation plan will be developed that identifies the areas for self-assessment improvement at BNL. The plan will prioritize the areas and include budgetary estimates and a schedule for implementation. The concept of continuous improvement, along with the establishment of innovative programs and measurement tools, will be realized through this program.

OHIO (MOUND)

The Mound Partnership Council, with representatives from OH, MEMP, and EG&G; the

Oil, Chemical, and Atomic Workers Union; and the Guard Union, has chartered an improvement team to assess the effectiveness of communications across the Mound site. Selection of team members is now under way by the President of the Oil, Chemical, and Atomic Workers Union.

Membership will consist of worker-level personnel from EG&G, including both bargaining- and non-bargaining-unit employees. The team is being organized in accordance with EWP principles, with EH technical assistance being provided. Upon completion, the team will rank the effectiveness of Mound's communication system and make recommendations for improvement.