



**ENVIRONMENT, SAFETY AND HEALTH
ONSITE TECHNICAL ASSISTANCE
ACTIVITY SUMMARY
APRIL–JUNE 1996**

ENHANCED WORK PLANNING

Richland Fernald Mound Idaho Oak Ridge
Savannah River Los Alamos Rocky Flats

RICHLAND

The Richland Operations Office and operating personnel at Hanford continued to work together in conducting the Enhanced Work Planning Demonstration Project at the Hanford Site. Projects are in progress at four participating facilities (PUREX, K Basins, East Tank Farms, and West Tank Farms), as well as in support of the sitewide Hanford Occupational Health Process. EH Mentors continue to support all EWP teams and projects.

RL is leading an initiative to develop and implement a Department model for a comprehensive, integrated approach to occupational health. The process provides a systematic approach to meet the needs of all parties responsible for occupational health, including line management; workers; and safety and health, medical, and training staff. The process provides a mechanism to coordinate information and information management systems such as hazard profiles, exposure data bases, training records, and medical information. It allows for medical services to be provided based on risk and provides a preventive approach through continual communication among all parties.

The EWP initiative is supporting this effort by developing and implementing integrated processes for hazard and risk analysis. Job hazard analysis is coupled with employee job task analysis, providing information regarding job requirements, hazards, exposures, and risks for the individual employee and each specific work activity. This information forms the basis for specifying the proper medical qualification exams for employees and enrolling employees in medical monitoring programs. The result is a risk-based occupational health process where medical monitoring is conducted for employees who are or who are likely to be significantly exposed to anticipated risks. Anticipated benefits from this process include—

- < Employees are placed in medical programs based on risk and not based on an administrative decision.
- < The quality of medical monitoring is enhanced with a risk-based approach.
- < Medical monitoring can be de-emphasized when risks are not evident.

- < Line management receives feedback from occupational medical programs to ensure hazard controls and work practices are achieving the intended worker protection result.
- < DOE has necessary hazard and exposure information for various population or epidemiological studies.

RL recently issued a directive to all Hanford Site contractors to implement this occupational health process, institutionalizing it across the Hanford Site. EH Mentors will continue to support implementation of the job hazard analysis/enhanced job task analysis processes at Hanford.

All four EWP demonstration projects at Hanford have successfully tested and supported implementation of (1) team approaches to work planning, including early involvement in work planning by workers and safety and health staff; (2) risk- and complexity-based approaches to work planning (using a graded approach) such as identifying work that can be performed within skill-of-the-craft; (3) integration of environment, safety, and health activities (such as exposure assessment) into work planning; (4) application of enhanced job hazard analysis processes; and (5) other concepts that address both planning effectiveness and worker protection.

Hanford is currently reengineering its work control and work planning processes at various facilities. Reengineering and EWP initiatives share many common principles, so where applicable, these efforts have been coordinated and combined to enhance the overall benefits of both initiatives. Reengineering and EWP efforts have concurrently been implemented at PUREX and West Tank Farms.

The development and implementation of the automated job hazard analysis system through the reengineering/EWP efforts is an example of how the two initiatives support each others. The first phase of EWP developed and tested an enhanced job hazard analysis process, including a new method for performing job hazard analyses at West Tank Farms. EWP team members then assisted reengineering team members in further developing and refining the job hazard analysis system to its current computer-based form. The resulting process has improved work planning efficiency and the quality of hazard identification and resulting controls and helped to integrate safety and health into work planning and work completion. The cycle times for work packages at West Tank Farms and PUREX have been reduced by 75 percent and 90 percent, respectively. Similarly, tasks requiring the highest level of work planning have been reduced by 50 percent at West Tank Farms and 90 percent at PUREX.

EH Mentors also continue to provide assistance to PUREX work teams in strengthening work control, worker protection, and enhancements to the job hazard analysis tool. The PUREX reengineering implementation has now matured and continues to exhibit significant success in its planning process by reducing the number of packages requiring complicated planning from 70 percent to 5 percent, maintaining a 10 percent average reduction in time spent per average job, and reducing the average cycle time of 133 days to 10 days for performing corrective maintenance.

West Tank Farms implemented its reengineering/EWP initiative in April. Enhancements also incorporate team planning with worker involvement, risk or complexity-based approaches, and use of the automated job hazard analysis process. Early results indicate a reduction in

average cycle time of work packages from 258 to 50 days, the number of detailed work packages being decreased by 50 percent, at the same time maintaining safety performance comparable to past performance even though productivity is greatly increased (thus safety performance improved when normalized to work activity).

The East Tank Farms has set the stage for initiating a demonstration phase for EWP on August 5, 1996. Scheduled enhancements include (1) implementing team planning approaches, (2) using the automated job hazard analysis tool, (3) applying a graded approach to planning work based on risk and complexity, and (4) working to generic work procedures supplemented by work-specific instructions, when applicable.

At K Basins, the focus of the EWP effort has been to demonstrate the employee job task analysis used to evaluate an employee's job requirements, hazards, exposures, and risks as part of the overall Hanford Occupational Health Process. Line managers, supervisors, and industrial hygienists were trained on the use and implementation of the employee job task analysis tool. The data collected from this demonstration are currently being evaluated and will establish the basis for employee enrollment into medical qualification and monitoring programs, optimizing medical qualifications and monitoring protocols relative to employee job task analysis information. In addition to obtaining information for medical surveillance, training requirements can also be reviewed and validated based on the employee's work environment. Lessons learned and suggestions for improvements are under consideration for inclusion in the next demonstration facility and for eventual sitewide implementation of this process.

OHIO (FERNALD)

During the second quarter 1996, the Fernald Enhanced Work Planning Demonstration Project continued to produce significant positive change in maintenance work control systems. Working closely with the project's multidisciplinary core team, EH Mentors have helped identify and enhance numerous aspects of the work planning and control processes.

Since the demonstration's start in June 1995, more than 35 key EWP products have been developed and implemented, resulting in an annual payback of more than \$7 million from the \$280K invested in the program (according to official estimates). These products include enhanced policies and procedures, new software, and improved training. As reflected in Appendix B, "Fernald EWP: Key Performance Measures," the initiative has dramatically improved planning and execution of maintenance activities.

Overall, the Enhanced Work Planning Demonstration Project at Fernald has become a practical tool for helping the site's maintenance organization shift from dedicated resources to a matrixed organization and to implement other strategic integration, continuous improvement, and reengineering initiatives. The fundamental tenets of the project included—

< A multidisciplinary team should review maintenance work packages in parallel (rather than sequentially) to enhance communication and expedite processing.

< Technical experts rather than planners, who may have limited knowledge of hazards or the various disciplines involved, should identify requirements for each job. This promotes a hazard-based, graded approach to planning.

< Clear-cut responsibilities and accountability must be established for technical experts who identify requirements. All support organizations (e.g., radiological controls, safety engineering, industrial hygiene) must develop a customer-driven approach to fulfilling their missions.

< Workers should be involved “up front” in planning work. Job walkdowns and automation of work package processing are critical to a safe and efficient work control system.

< Fair and meaningful accounting systems and performance measures should be established to ensure proper management of the work control system.

During this reporting period, mentoring activities for enhanced work planning at Fernald centered around four key initiatives: (1) helping management fully implement the enhanced policies and procedures; (2) completing development of the Electronic Work Package software; (3) enhancing linkages between the Medical Department, the safety and health organizations, and those planning and executing work; and (4) disseminating information and lessons learned from the Fernald EWP Demonstration Projects to various organizations within DOE Headquarters and to other sites throughout the complex.

To help Fernald management fully institute the enhanced policies and procedures, EH Mentors assisted in developing training courses covering the new maintenance work control procedure, the Electronic Work Package software, job planning and estimating, and other topics. In addition, EH Mentors helped develop a customer survey protocol and establish a sitewide maintenance Help Line to identify and resolve problems that might arise.

Extensive assistance was also provided to assist the completion of development of the Fernald Electronic Work Package software. Essentially, the software automates the enhanced work control process using a standard software package that has been customized to meet site requirements. Work packages can now be routed in parallel to reviewers who electronically attach necessary plans, permits, Material Safety Data Sheets, job hazard analyses, and other information. Features of the software include electronic routing and signature, automatic “manager alerts” and rerouting of the package to an alternate reviewer (should delays occur), incorporation of electronic photographs and drawings, and full text indexing for automated sorts based on hazards and task type. Fernald estimates that cost avoidance resulting from this \$26,000 investment will exceed \$2 million in 5 years.

EH Mentors also assisted the site in finalizing conceptual enhanced linkages between the Medical Department, safety and health organizations, and those planning and executing work. As a result of Fernald efforts, a model was developed to enhance the quality and quantity of work activity and exposure information available to various groups. The model especially aids the Medical and Industrial Hygiene Departments and epidemiologists. It also presents a tremendous benefit to the worker by enhancing his or her understanding of workplace exposures that have occurred over the course of years or even decades. Recent presentations of the concept have generated enthusiastic endorsements from the Office of

Epidemiologic Studies (EH-62), contractor safety and health organizations, and DOE Area and Field Offices.

To make the “enhanced reporting” conceptual model a reality, the contractor will link the Fernald Electronic Work Package software to standard site accounting and industrial hygiene data base systems, thus enabling production of enhanced reports. These reports will serve as a more defensible record of “who was where,” “when,” “to do what,” “under which permits and controls,” and “with what resulting exposures.” This will enhance documentation of the exposures and work activities of workers who might someday bring legal suit against the Department due to alleged health effects. This initiative will likely result in cost savings stemming from increased protection of the government from legal liability.

Finally, EH Mentors have been actively involved with disseminating information and lessons learned from the Fernald EWP Demonstration Project to various organizations and sites throughout the complex. In particular, support was provided during a visit to the site by the Defense Nuclear Facility Safety Board, who observed that the Fernald EWP project is a practical means of meeting objectives of DNFSB Recommendation 95-2. EH Mentors participated in presentations about the Fernald EWP Demonstration Projects to audiences at Hanford during the EWP Core Team Leader’s meeting, the American Industrial Hygiene Conference, a meeting of the Energy Facility Contractors Operating Group, and at other DOE sites, including Oak Ridge, Rocky Flats, and Mound

OHIO (MOUND)

EH Mentors helped launch additional initiatives to achieve the goals identified by the Work Control Team at the Mound Plant. Initial Work Control Team efforts focused on Core Team review of work requests and establishment of a pilot scheduling initiative, two areas that continued to improve coordination between all parties involved in the work control process and the way work was executed.

The pilot scheduling initiative has been highly successful. Participation in weekly scheduling meetings has doubled as individuals recognize that scheduled work translates directly into completed work. In fact, the percentage of scheduled work completed continues to average 95 percent. At the same time, EH Mentors assisted in developing new procedures to streamline the scheduling process by having participants call in information ahead of time, thus reducing the length of the meetings, maximizing both efficiency and participant interest. Minimizing the length of the scheduling meetings is considered critical to successful implementation of efforts to include maintenance jobs other than those involving radiation control technician support.

During this reporting period, six new enhancement initiatives identified by the EWP team were implemented. The first involved exporting existing successes to other sites and other activities at Mound and in the Ohio complex. The Mound Scheduling Team leader and the EH Mentor visited Fernald to participate in one of its Core Team meetings. During the meeting, Mound’s team leader presented the scheduling successes achieved to date at Mound. During the visit, the team leader and the EH Mentor also attended a Work Coordination Center meeting to determine whether the Work Coordination Center process at

Fernald might benefit Mound. Fernald's electronic work request package was also reviewed for potential application at Mound.

The Enhanced Work Planning team established a working luncheon to improve communications between the onsite contractor and the Miamisburg Area Office. These luncheons are attended by key individuals in each organization, including the Miamisburg Area Office Associate Director, Office of Safety, Operations and Technical Support; the EG&G Vice President, Transition and Facility Management; the EG&G Vice President, Environment, Safety, and Health; EH Mentors; and Mound maintenance personnel, to improve understanding by senior management of enhanced work planning initiatives. The Miamisburg Associate Director of Safety and Health, acknowledged the positive changes in work scheduling and the inclusion of radiation protection personnel in the work scheduling process. The luncheons also provided an opportunity to highlight cost avoidances by improving use of scheduled resources and the potential for expanding the Enhanced Work Planning project into other activities at Mound. As a result, the October 1995–March 1996 Cost Plus Award Fee report published in June recognized Mound's enhanced work planning efforts as a "notable achievement."

Mound management also established a separate planning team to review enhancements in the maintenance planning process. The team identified six areas for review, including earlier initiation of Radiation Work Permits, eliminating redundant walkdowns, defining radiological control planning responsibilities, improving work scoping, scheduling of the planning effort, and integrating radiological control and maintenance planning.

In addition, an issue involving setting priorities had surfaced as an item of concern to building managers who were held accountable for work in their areas. The EH Mentor facilitated meetings between the planning team and selected building managers to determine whether existing work request priorities were adequate to ensure that the planning effort was spent on the most important requirements. Past procedures sometimes resulted in planners and estimators working on a low-priority job, ordering materials, and then moving the job to the backlog where it stayed, sometimes until canceled. A new method of providing the building managers with a means to prioritize work in the system was developed and implemented that is projected to improve planning efficiency significantly.

Another enhancement implemented this reporting period will help to obtain earlier initiation of radiological work permits. Procedures were implemented to tie the radiological work permit to the maintenance work request, which improved work efficiency by avoiding the time wasted by foremen chasing signatures on last-minute permits.

During this reporting period, the EH Onsite Technical Assistance Program assisted Mound in arranging a site visit to two commercial nuclear power plants for members of the Enhanced Work Planning project team. During a meeting with EG&G's Vice President for Environment, Safety and Health; the Radiological Control Manager; and the Radiation Protection Operations Manager, Mound management determined that members of the Enhanced Work Planning project team should visit two commercial nuclear power plants to benchmark the work control/planning process. The EH Mentor facilitated this effort for representatives from Radiological Operations, Radiological Engineering, and Maintenance to visit the Three Mile Island Nuclear Plant operated by General Public Utilities and the Susquehanna Steam Elec-

tric Station operated by Pennsylvania Power and Light. Following the site visits, the Enhanced Work Planning Demonstration Project team concluded that both plants have implemented sitewide integrated work schedules that are considered critical to obtaining buy-in from all affected disciplines. Discussions are under way to develop a 1-month look-ahead schedule as a test case to achieve a sitewide integrated schedule.

To overcome time lost due to last-minute notification of training requirements, the Work Control Team solicited assistance from the centralized training organization. The two organizations developed a 1-month projected training schedule that is updated and distributed weekly to the foremen who use it as a management tool to schedule their employees training more efficiently. Initial feedback from the centralized training organization indicates that the schedule has significantly reduced the number of projects where workers are unavailable because of training while increasing worker efficiency.

Finally, the EH Mentor assisted the safety organization in coordinating a performance indicator workshop to develop safety program evaluation metrics. Team members from several separate organizations were brought together to define overall project performance criteria. They selected personal protective equipment as the targeted program and quantified characteristics that contribute to the success of the program over time (e.g., worker awareness, equipment availability, and verification of program effectiveness). When tracked and monitored, these characteristics provide team members and senior sponsors an indication of how well personal protective equipment program implementation is progressing, as well as specific areas that can be targeted for improvement.

IDAHO

Throughout this reporting period, EH Mentors continued to provide technical assistance to the Enhanced Work Planning Demonstration Project. The project focuses on the development and implementation of an enhanced work control process at the Idaho Chemical Processing Plant.

In January, EH Mentors teamed with management from the DOE Idaho Operations Office (ID) and the Idaho National Engineering Laboratory (INEL) to form an Enhanced Work Planning Team and develop a strategy for implementing enhancements to the work control process. Techniques, lessons learned, and best practices from other DOE facilities were incorporated into the revised process. ID reviewed and approved plans to apply enhanced work planning concepts for improving cost effectiveness while maintaining or improving worker protection and safety performance.

The revised work control system developed for the Idaho Chemical Processing Plant will produce improvements in worker productivity, reduce maintenance backlogs, and result in a substantial cost avoidance. Plant management plans to implement the revised process in August. The integration of this process and standardization of practices throughout the Idaho National Engineering Laboratory is a longer-term vision. The Idaho Chemical Processing Plant work control process serves as the framework for developing a revised work control system for maintenance activities at facilities that are no longer involved in process operations throughout INEL and may be expanded to cover facilities still involved in production operations.

The enhanced work control system applies a complexity- and risk-based approach to ensure that the level of formality of work planning is appropriate for the job. Simple, low-risk jobs can be completed with limited planning and approvals. For more complex jobs, multidisciplinary teams that include craft personnel review the proposed work to identify hazards and plan the work. The Enhanced Work Planning Team developed an interactive, computer-based tool to assist work order preparers in streamlining work package development and approval.

The Enhanced Work Planning Team first reviewed a similar tool developed at the Hanford site. Richland-based EH Mentors presented a demonstration and led a discussion at the Idaho Chemical Processing Plant of the PUREX job hazard analysis screening tool and its application at PUREX. This tool provides a mechanism for work planning and control based on job hazards. It is used to evaluate work requests and determine if the planned work can be categorized as low hazard and low complexity, thereby requiring lower levels of work controls and fewer reviews and approvals. This tool can provide recommendations concerning disciplines that should review the work package and contains reference information for use in determining how to mitigate hazards.

Based on review and evaluation of the PUREX job hazard analysis screening tool, the Enhanced Work Planning Team developed a job requirements checklist for use at INEL. This tool is used by all personnel trained and authorized to prepare work packages at the Idaho Chemical Processing Plant. It consists of a series of questions to be answered by the responsible person to determine the organizations that should provide technical advice, reviews, or approvals for work packages. The tool ensures that the appropriate support organizations are contacted for advice or approval regarding hazard recognition and mitigation, personnel safety requirements, and regulations to be addressed for safe and correct job execution. Through use of this tool, the Chemical Processing Plant has achieved a 20 to 25 percent reduction in total staff-hours required for job planning while ensuring that environment, safety, and health issues are fully addressed.

The Enhanced Work Planning Team is also developing an integrated scheduling system to standardize and combine all activity and resource data into one common data base. This system will allow coordination of activities among Engineering, Planning, Procurement, Operations, and Maintenance to fulfill the plant schedule commitments. The three major components of the integrated scheduling system will be the integrated data base, the plan of the week, and the plan of the day. EH Mentors assisted Idaho in developing the plan-of-the-week and plan-of-the-day concepts by sharing procedures and lessons learned from other DOE sites and the commercial nuclear power industry.

The plan of the week will involve a standing meeting with directors and Operations management, chaired by the Facility Integration supervisor. The purpose of this meeting is to prioritize the ready-to-work jobs identified from the integrated schedule data base. The Facility Integration supervisor will identify and resolve conflicts resulting from concurrent demands for common resources, resolve differences in opinion concerning priorities, and obtain management consensus for executing work. The outcome of each meeting will determine the sequence in which jobs are to be performed for the week.

The plan of the day meeting provides a single point of contact (Facilities Integration supervisor) for daily resource management and resolution of issues within the Chemical Processing Plant that impact the completion of maintenance and operational activities. The designated point of contact coordinates activities among Engineering, Planning, Procurement, Operations, and Maintenance to ensure timely and safe work execution. This meeting provides line management and their designated representatives the opportunity to review and agree on work priorities at the plant and to resolve issues that affect the approved daily schedule.

The integrated scheduling system, resource limitations effecting maintenance work (such as personnel resources, use of equipment, and outage requirements), and activity and resource conflicts can be resolved, thereby minimizing disruption of work. Conservative estimates of benefits from implementing the system are a greater than 10 percent improvement in craft resource utilization, greater than 10 percent improvement in Radiological Control technician utilization, and savings of 50 staff-hours per week due to reduction in work delays caused by common-use equipment unavailability.

The Enhanced Work Planning Team also drafted a streamlined maintenance work control procedure (the Idaho Chemical Processing Plant work order control process) for performing maintenance activities in a safe and timely manner. The process incorporates a revised work order priority rating system so that management can identify required work and efficiently process work orders through the work control system. The system ensures that environmental, safety, health, compliance, and operational issues are considered in scheduling resources in concert with the integrated schedule.

An EH Mentor from Hanford visited INEL to exchange information concerning maintenance activities at Hanford with personnel at the Chemical Processing Plant. The EH Mentor presented information concerning guidelines for skill-of-the-craft maintenance and recommended changes to the draft maintenance work control procedure. Other EH Mentors also met with the Enhanced Work Planning Team to share information developed at other DOE sites regarding performance indicators for the work control process. Drawing on experience in developing performance measures at Hanford facilities, the Enhanced Work Planning Team developed performance measures and a management report for the Idaho Chemical Processing Plant enhanced work control process. Baseline values will be established and used to monitor changes in performance. The factors measured will include customer satisfaction, costs, and quality. It is also considered important to develop real-time feedback in the work control system as well as longer-term performance indicators.

OAK RIDGE

During this period, efforts focused on developing a computerized planning tool, the Work Permit Planning Information System, for eventual distribution to K-25 Site divisions. Although the computerized planning tool will be updated within the Waste Management Division, it will serve as a link between K-25 Site divisions. Development of the system is being coordinated with Maintenance Division planners and personnel from other divisions to facilitate transition and use of the computer planning tool by their divisions. A work-planning document, "Prejob Planning Worksheet for Nonroutine Operations," has been developed in parallel with the Work Permit Planning Information System to facilitate the process for using

the enhanced work planning team approach to planning work activities. This document will help transition from current “paper” practices to ready use of the computerized planning tool by familiarizing users with the tool and reducing learning-curve time.

Before the K-25 Site initiated its Enhanced Work Planning Demonstration Project, the planning process required the job request originator to obtain serial review and approval of the project. Any comments or changes initiated by any one of the individuals required repeated coordination among those who had already reviewed the work package. Obtaining required reviews and approvals could typically require several days of coordination.

With the computerized planning system, the originator initially enters a description of the activity being planned into the system on the first page of the computer planning document, then identifies all applicable permits (e.g., Safety Work Permit, Radiation Work Permit, Lockout/Tagout) along with other requirements. Embedded prompts will guide the originator through this process. For a given permit, the originator of the work package or Enhanced Work Planning Team members can review information relative to determining the applicability of the permit. This information includes—

1. When is the permit required?
2. What are the training requirements for the permit?
3. What are the laws, Orders, and procedures that drive the permit or requirement?
4. What forms or tags are required?
5. Who are the site contacts to obtain additional information?

After entering the initial planning information, the originator electronically forwards the computer planning document to applicable support personnel (e.g., Health and Safety personnel, samplers). Support personnel electronically enter comments on the document and return the documents with comments to the originator, who makes the appropriate changes.

The Work Permit Planning Information System will primarily be used for nonroutine projects. The software allows continuous improvement based on lessons learned and experience. This program will greatly facilitate elimination of redundancy in permits.

Based on results from a thorough review of the work planning process, Oak Ridge’s Enhanced Work Planning process involves coordinating the project through a planning group. The group meets at least once a week or more frequently as determined by workload and comprises all the individuals required to review and approve the project. Through use of the computerized planning system, it is estimated that many proposed projects can be reviewed and approved by the planning group within 2 hours or less, with an expected reduction in planning time for nonroutine projects of up to 50 percent. This reduction in planning time will be dependent on project type and scope. Major components of this reduction are (1) integrated team planning versus separate coordination of participants, (2) use of the Work Permit Planning Information System to identify required permits and other necessary requirements versus the time-consuming effort to secure applicable permits and requirements, and (3) a mechanism to resolve rapidly any conflicting requirements.

Improvements in the work planning process as a result of the Enhanced Work Planning Demonstration Project, including development and implementation of the Work Permit

Planning Information System, are expected to reduce costs associated with project delays by at least 20 percent. Project delays can be the result of any one of several factors, including failure to provide proper permits, conflicts in permit and work requirements, and failure to assign necessary support personnel. Use of the computerized system and coordination of projects through the planning group should greatly reduce or eliminate many of the factors that often result in project delays.

At the beginning of the Enhanced Work Planning Demonstration Project in Oak Ridge, the Core Team selected two pilot projects to evaluate application of Enhanced Work Planning concepts and to quantify benefits from implementing improvements in the planning process. The K-1420-A Sludge Removal Project involves chemical, radiological, criticality, and industrial safety concerns. The K-1202 Storage Tank Valve Replacement Project requires the removal and replacement of a leaking valve and involves chemical, chemical, radiological, and industrial safety concerns. The waste storage tanks in both projects have held a variety of waste streams. For both pilot projects, the integrated team planning approach helped identify and resolve issues and concerns and enhanced the team members' awareness of hazards and issues outside their area of expertise. The two pilot projects will also provide the opportunity for identifying lessons learned and enhancements that can be made in the overall planning process within the Waste Management Division.

During this period, Oak Ridge completed preparation of the K-1202 valve replacement work package. Craft, craft supervisors, planners, and health and safety personnel reviewed work options and associated hazards. As a suggested contingency and with team approval, the work plan included replacing the entire line to the K-1202 tank versus replacing only the existing leaking valve. Due to the potential for deterioration of the tank line, the Project Planning Team decided that replacement of the entire line would be prudent, thereby eliminating additional subsequent field activity and creating savings on project costs. The project is currently awaiting approval for the modifications to the Resource Conservation and Recovery Act (RCRA) Part B Permit. All required equipment is available and permits have been prepared.

The Enhanced Work Planning Core Team has provided support for other activities beyond the selected demonstration pilot projects. For example, the team helped conduct pre-operational readiness reviews and plan Proof-of-Process Demonstration Pilot Projects to facilitate subsequent large-scale project planning. Examples of projects that have been coordinated through the Core Team relative to pre-operational readiness review initiatives include the K-1423 Container Processing Facility and the Central Neutralization Facility Repackaging Operations. The K-1423 Container Processing Facility will process PCB-contaminated containers and parts to facilitate disposal and/or volume reduction. The Central Neutralization Facility project involves repackaging of sludge from 30-gallon containers into larger capacity containers to use available space more efficiently.

Coordination of the pre-operational readiness reviews through the Enhanced Work Planning Core Team helped identify and resolve health and safety issues before the formal review was conducted and provided a more efficient planning and coordination cycle. Use of the Enhanced Work Planning Core Team enhances the effectiveness of the operational readiness review.

One of the key elements of the enhanced work planning initiative is the inclusion of industrial hygiene and medical monitoring data into the work planning process. During this reporting period, EH Mentors assisted Oak Ridge personnel investigate ways to transfer information and data from the Industrial Hygiene Analytical System computer data base to the Medical Occupational Health Information System. EH Mentors are helping to evaluate how occupational safety and health hazard information and exposure data can be shared with medical providers so that the information can be readily used by Medical personnel. Identifying the best reporting format to provide safety and health hazard information and exposure data to Medical personnel is the first step linking the two computer systems. Establishing an improved reporting format and subsequent small scale evaluation and refining the electronic linkages between the Industrial Hygiene system and Medical's Occupational Health system will precede more wide-scale use.

Medical and Industrial Hygiene personnel discussed how to exchange occupational safety and health hazard information and exposure data. Effective exchange of this data is vital to ensuring a successful medical surveillance program. Conveying this exposure data from Industrial Hygiene to the Medical Department in a useful format will enhance the medical surveillance process. The type of data identified for use by Medical personnel for screening exposures of concern includes a summary of workplace hazards; a summary of personnel and group exposure data, including average and maximum exposure values; applicable reference values; and a summary of exposures that exceed action levels, including the dates on which the exposures exceeded the action levels. The intent is to electronically transmit appropriate summary reports to the Medical group, but a mechanism to implement electronic transfer from the Industrial Hygiene system to the Medical system has not yet been identified.

The benefits to be derived from electronically linking the two systems include—

- < Medical providers can better identify potential exposures of concern by associating occupational exposures with symptoms during the medical examination process.
- < Through enhanced communication with the Medical Providers, Industrial Hygienists can better determine chemicals or other occupational exposures of concern requiring intensified surveillance and enhanced controls. This will allow for more efficient use of Industrial Hygiene's resources.
- < Worker protection from occupational exposures can be enhanced through improved medical surveillance efforts.
- < Occupational exposure and medical surveillance requirements can be more effectively and efficiently integrated into the work planning process.

SAVANNAH RIVER

Throughout April, May, and June, progress continued on the enhanced work planning initiative focused on waste minimization. This initiative is building on site successes in waste minimization using the enhanced work planning process to improve productivity and efficiency while enhancing worker safety and health, and reducing the environmental impact of operations at Savannah River. This initiative provides an opportunity to evaluate enhanced work planning concepts (multidisciplinary teams, worker participation, and Health and Safety personnel fully integrated into work planning) in a project that provides some unique benefits that should be readily exported throughout the DOE complex, including—

< Work planning enhancements present significant opportunities to reduce the environmental impact of onsite waste burial by reducing the volume of waste generated. Resulting cost savings estimates project a 40 percent reduction in waste at the Nuclear Materials Stabilization Program facility, alone, with opportunities for disposal cost savings of approximately \$8 million.

< Clearly defined measurement metrics exist based on the cost of site, burial, safety enhancements from reducing the radiological hazards in the work place, and productivity improvements from enhancing the planning of decontamination activities.

< The challenges of planning decontamination activities (controlled area rollbacks) in an operating facility with transuranics contamination present some unique opportunities to implement and document good practices that can be exported to other Savannah River facilities, as well as throughout the DOE complex.

During the past quarter, the team focused on developing a “rollback handbook” and infusing waste minimization into the work planning process. The rollback handbook will be used to capture the process being implemented throughout H-Canyon. This handbook will describe the process to implement a successful rollback, including lessons learned and enhancements to the work planning process. The handbook, which will be exported to other Savannah River Site facilities describes (1) management sponsorship, (2) individual and organizational roles and responsibilities, (3) performing cost benefit analysis for implementing process and technology improvements and waste minimization, (4) developing a facility approved rollback plan, (5) developing a resource loaded schedule, (6) training personnel, (7) implementing schedule, (8) determining performance measures, (9) facility specific techniques, (10) enhanced work planning concepts, and (11) lessons learned. A draft of this handbook is scheduled for completion in July.

The following activities are under way to incorporate waste minimization techniques in the work planning process:

- < Baseline existing work planning process;
- < Reviewing work packages to identify current level of waste minimization planning;
- < Identifying additional planning concepts—
 - training for first line supervisors and work planners,
 - implementing a contaminated tool inventory system/database,
 - implementing a graded approach to waste minimization planning,
 - incorporating radiological controls expertise into the planning process, and
 - modifying the work package procedure to flag waste minimization opportunities;
- < Developing an action plan to implement the planning concepts.

In addition, the core team is evaluating a process to generate Pollution Prevention Activity Forms for documenting measurable reductions in waste generated during the work planning and postjob debriefing process.

LOS ALAMOS

During this quarter, Los Alamos National Laboratory and the DOE Los Alamos Area Office made significant progress in reengineering the Laboratory's work control process using enhanced work planning concepts. The Los Alamos Facility Security and Safeguards Division is directing the reengineering effort. The Los Alamos National Laboratory work control effort is developing a work control system that enhances safety and streamlines business processes. The expected benefits are to increase productivity; build environment, safety, and health control into the system; obtain employee buy-in; reduce costs of doing work; and establish consistent laboratory-wide work control processes. To improve the work control process, Los Alamos National Laboratory, with support from the DOE Area Office, formed six teams: (1) risk-based grading, routine versus nonroutine work; (2) emergency work process; (3) work funding/accountability; (4) work package definitions and requirements; (5) safety reviews/permitting/workers input; and (6) procurement/work control interface.

By the end of the quarter, Teams 4 and 6 had merged and were supporting Team 5. A draft emergency work process was being developed. Team 1 has drafted risk-based grading and skill-of-the-craft requirements documents.

The results of the teams' efforts were presented to Los Alamos National Laboratory senior management and the DOE Area Office at the end of May. Los Alamos National Laboratory senior management fully supported development and piloting of the reengineered, improved work control system. In addition, Los Alamos National Laboratory senior management suggested that the new work control system should be piloted and implemented Laboratory-wide as soon as possible and assigned Los Alamos National Laboratory staff and site resources to this effort. A team was formed to determine how and where to pilot the new system. The EH Mentor for enhanced work planning and work control at Hanford's K Basins visited Los Alamos National Laboratory in June to assist the Facility Security and Safeguards Division with the pilot project and implementation of the new work control process.

At the quarter's end, the Los Alamos National Laboratory Work Control Team had decided where to pilot the reengineered Enhanced Work Planning/work control process, with the pilot project beginning in July and scheduled for completion at the end of August. During the first part of September, the Facility Security and Safeguard Division will begin implementing the reengineered Enhanced Work Planning/work control process Laboratory-wide. Los Alamos National Laboratory is targeting the end of December 1996 for implementation of the reengineered Enhanced Work Planning/work control process throughout the Laboratory.

ROCKY FLATS

During this quarter, the DOE Rocky Flats Field Office and its integrating contractor met with EH Mentors and the Maintenance manager from Fernald to exchange technical information on EH's complexwide Enhanced Work Planning Demonstration Project and Rocky Flats' Activity-Based Management and Integrated Work Control Programs. The purpose of the meeting was to transfer technical information, work products, and work control ideas among the meeting participants. Rocky Flats participants expressed substantial interest in the Electronic Work Package Program, job hazards analysis methodology, and job task analysis

methodology already developed and implemented at other DOE sites under the EH Enhanced Work Planning initiative.

During the technical exchange meeting, participants agreed that occupational medical specialists need to be involved in the Activity Control Envelope Team meeting, even though workers and health and safety representatives are already involved in the process. The Rocky Flats activity control envelope process is an alternative process that uses empowered teams with relevant experience to establish the necessary and sufficient standards basis for specific scopes of work with manageable uncertainty. The process focuses on the hazards and uncertainties presented by the activity and ensures that a graded approach is applied to the development of controls that maintain an adequate margin of safety against those hazards and uncertainties. The standards set developed with this process will be used in developing work control documents to govern the actual performance of work. Rocky Flats is very interested in ensuring involvement of occupational medical specialists in the Activity Control Envelope Team meetings on the Wet Combustible Project and the Deactivation Project to observe how these team meetings are conducted.

The EH Mentor met with a representative from Rocky Flats and the contractor's Maintenance manager to develop a list of items that can be used to help the contractor improve the site's Integrated Work Control Program. The EH Mentor and the Maintenance manager from Fernald will provide additional information requested by Rocky Flats.

FERNALD EWP: KEY PERFORMANCE MEASURES

ITEM	BASELINE	CURRENT
Maintenance work request (MWR) completion time	150 days	21 days
Backlog of MWRs	4910	2800
Backlog of asbestos MWRs	481	130
Safety and health review of MWRs	70%	100%
Multidisciplinary (“enhanced”) review by non-safety-and-health organizations of the Work Coordination Center	50%	100%
Time required to route MWRs to all appropriate parties for review	8 days	1 day
Time required for safety and health review	3 weeks	1 week
Time charged to MWR “Delay Codes”	570 hours* *12/95–2/96	450 hours* *3/96–5/96 (projected)
MWRs delayed due to “inadequate work descriptions”	approx. 40%	approx. 10%
Duplicate MWRs entered into system	12%	2%
Planner’s time spent “chasing” signatures	90%	15%
Variance between MWR cost estimates and actual cost	+\$77K/month average (9/95–2/96)	+\$14K/month average (1/96–2/96)
Prejob walkdowns performed on MWRs	<5%	15%
Prejob walkdowns performed on MWRs (judged ahead of time to warrant one)	5%	100%