

SAVANNAH RIVER SITE ENVIRONMENTAL, RESTORATION LESSONS LEARNED PROGRAM (U)

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SAVANNAH RIVER SITE
ENVIRONMENTAL RESTORATION LESSONS LEARNED PROGRAM (U)

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ABSTRACT

In the almost three years that the Environmental Restoration Department has been in existence at Savannah River Site, many activities have been performed. From waste site investigations to closure activities, positive, as well as negatively impacting lessons have been learned. Until recently, lessons learned were captured by the department on a less than formal basis. Now, a program based upon critiques, evaluations and corrective actions is being used by the Savannah River Site Environmental Restoration Department. This presentation reviews the development, implementation and use of that program.

INTRODUCTION

The Savannah River Site is a key nuclear weapons production facility covering approximately three hundred square miles of federally owned land in western South Carolina. The primary mission of the site is production of tritium and other special nuclear materials for use in our nation's defense. Construction of the site began in 1951, with the first of five nuclear reactors going critical in 1953. Construction of the basic plant was completed in 1956. Today the site employs over 20,000 people and is managed for the Department of Energy by the Westinghouse Savannah River Company.

The site consists of seventeen major operating areas and numerous smaller facilities. Over the years, production at these sites has resulted in the generation, handling and disposal of chemical, solid and liquid hazardous and mixed wastes. In 1978, after a program of sampling, the site independently recognized that there were contamination problems at a disposal settling basin for heavy metals and volatile organic compounds, and at other disposal settling basins for chemicals, hazardous metals and pesticides. Studies and remediation programs were initiated. By 1984, disposal settling basins were closed and remediation activities were underway. These initial efforts were managed by six different production organizations across the site. Since each organization was working independently, with little state or federal guidance, the interpretation of what needed to be done, the importance of the activity, and the techniques which were employed for remediation were far from consistent.

In the early 1980's, the Savannah River Site established the Environmental Protection Department to interface with the Department of Energy, and state and federal regulators. This department recognized the need for a program with a consistent understanding of remediation and implementation requirements. In 1985 they began attempts to coordinate site activities and, without formal authority, assigned responsibilities for remediation to the six operating departments. Since these assignments were only advisory in nature, the operating departments acted upon them with varying responses. It soon became apparent that the operating departments were placing higher priority on operating matters than on environmental remediation activities. This was the first major lesson learned in the site's environmental remediation effort—a large, complex site, with many operating departments, must establish an independent group with the necessary authority and resources to develop techniques and to effectively and efficiently manage environmental restoration activities.

THE ENVIRONMENTAL RESTORATION DEPARTMENT

To solve this problem at Savannah River Site, the Environmental Restoration Department was created in the fall of 1990. The random mix of scientists and engineers working independently in the six operating departments were brought together under one roof, with one management charged with, and dedicated to, environmental remediation. This department was originally comprised of five sections: Program and Administrative Management, Groundwater, Assessments, Closures, and Quality Assurance. Shortly after the department's creation, Quality Assurance was removed from direct departmental control to assure independence.

Each of these sections operating together provided the necessary emphasis for an effective environmental restoration program at Savannah River Site. Economies of scale

were recognized by having all of the needed disciplines together in one organization. The interface with our customer and our regulating agencies was improved, since they now only had to work with one department, rather than six. The liabilities resulting from multiple groups understanding what had to be done, and then acting properly, were removed. Because it was totally responsible for all activities, the Environmental Restoration Department was able to provide assurances to Westinghouse Savannah River Company upper level management that site environmental restoration activities were being done properly, according to state and federal regulations. And last, but not least, by having all environmental restoration activities centered in one organization, the advantages of a "lessons learned" program was able to be incorporated.

LESSONS LEARNED PROGRAM OVERVIEW

Savannah River Site has a comprehensive lessons learned/information dissemination program under the site's Facility Safety and Evaluation Section (FSES). FSES receives information, primarily nuclear and safety related, from the site's various departments and divisions, and the nuclear industry as well. Information is disseminated across the site where it is reviewed and evaluated for applicability and appropriate corrective action by the respective departments. Division procedures exist defining lessons learned generation, reviewing, tracking and trending requirements. Recordable incidences, reported through SIRIM (site Item Reportability and Issue Management) are also included in the program.

The Environmental Restoration Department and the Department of Energy knew that a solid lessons learned program was key to the site's environmental success. In November of 1992, we set out to change our program by identifying procedures requiring revision and defining the needs for a database, infrastructure and a publication specific for environmental restoration/remediation-type lessons learned. Today this program includes a lessons learned program procedure, critiques, evaluations, corrective actions, a database and a publication.

LESSONS LEARNED PROGRAM PROCEDURE

Central to reshaping the Environmental Restoration Department's Lessons Learned Program is its management procedure. Originally drafted under conceptual program development, this procedure was revised to reflect major changes in the site and division level lessons learned procedures. The Environmental Restoration Department's Lessons Learned Program procedure defines roles and responsibilities for lesson learned critiques, evaluations and corrective actions. Figure 1, Environmental Restoration Department's Lessons Learned Program Flowchart depicts the general avenues by which lessons learned are handled. Department, division, site or related industry lessons learned enter the program through critiques, site-wide distributions, publications and trade magazines. Lessons learned are evaluated for service area applicability and appropriate corrective action. Applicable lessons learned are entered into the Environmental Restoration Department's Lessons Learned Database for future reference. Corrective actions are tracked through completion.

LESSONS LEARNED CRITIQUES

In the past, lessons learned critiques for environmental remediation projects were conducted only at the completion of given waste unit. Much of what was learned was

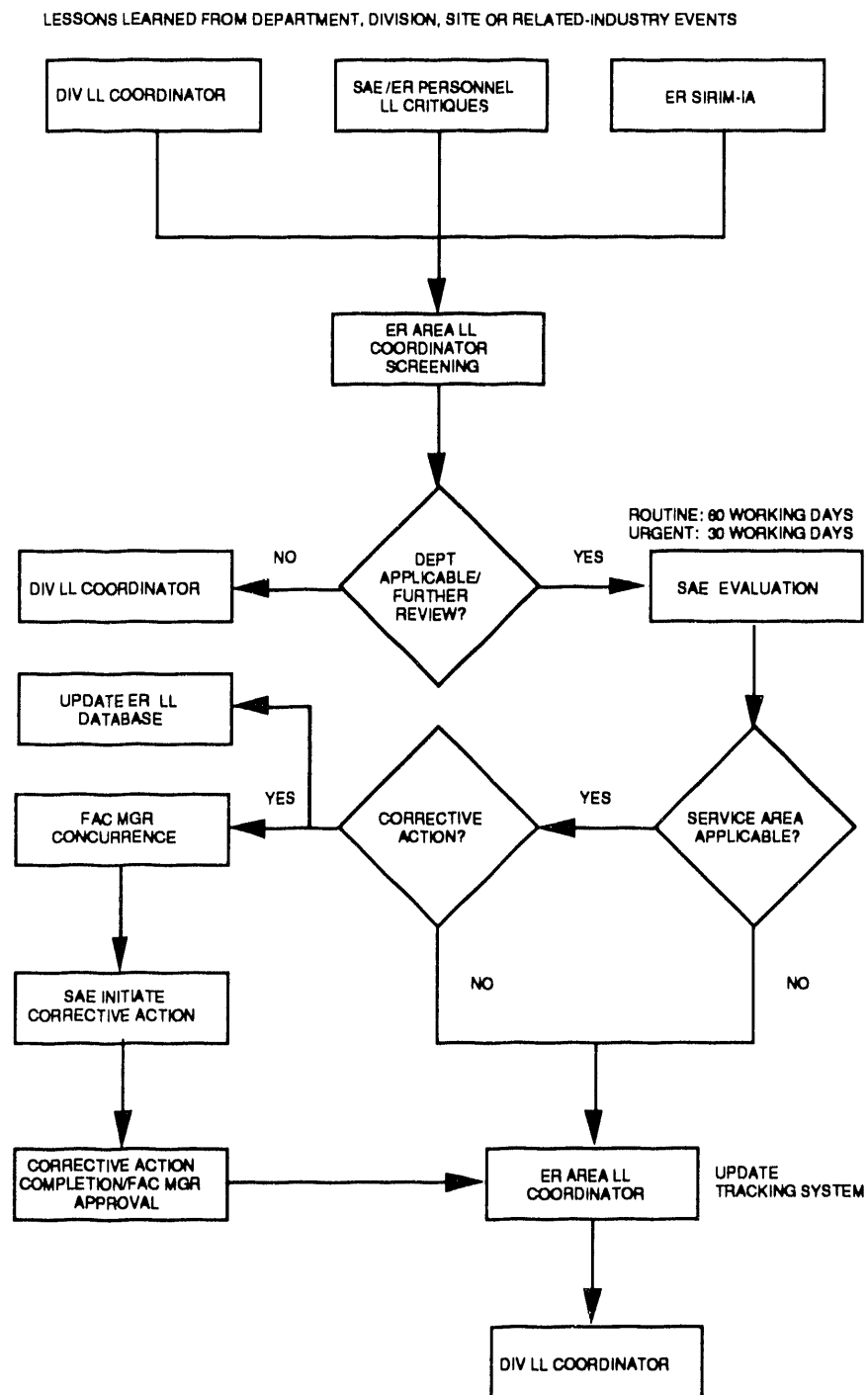


Figure 1. Flowchart of the Environmental Restoration Department's Lessons Learned Program

lost because the length of these projects often averaged several years. During that time, personnel frequently changed assignments and certain details were lost due to lapses of memory. Now, lessons learned critiques are performed at the completion of each project milestone, often identified as its lifecycle step. Critiques are also performed at:

- completion of audits, reviews and evaluations by external or independent organizations
- development or implementation of an idea or method to correct, modify or otherwise improve current operating or programmatic processes
- experience of any recordable events as defined by the SIRIM program, including events of down-graded significance, to reduce their recurrence as higher graded occurrences
- receipt of documents or reports, including publications or trade magazines, generated outside the Environmental Restoration Department but applicable to environmental remediation activities

Lessons learned critiques are submitted to the Environmental Restoration Area Lessons Learned Coordinator for review and evaluation prior to dissemination as applicable. Critiques ask questions general questions such as:

- What was the event?
- What was the action taken resulting from the event?
- Was this action the corrective action or should other action have been taken?
- Is the event applicable to the Service Area, Department, Division, Site or related industry?
- Was the event safety, regulatory, design, programmatic or documentation related?
- If the event was safety related, did it involve an employee, the environment or equipment?
- If the event was regulatory related, did it concern RCRA or CERCLA?
- Did the event result in a cost, schedule or technical impact?

LESSONS LEARNED EVALUATIONS

Lessons learned evaluations use a concept called service areas. Developed by Environmental Restoration Department's Training Group, service areas are organizational or functional groups of jobs that include related knowledge, skills and performance requirements which are addressed by specific standards, regulations/orders/laws and procedures. Examples of service areas include the given management groups and specialized personnel.

Cognizant representatives from these service areas are called service area experts. These experts evaluate lessons learned for area applicability and appropriate corrective actions. Lessons learned are either; not applicable, applicable—no action required, or applicable—action plan required. A typical evaluation form is shown as Figure 2.

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Environmental Restoration

Lessons Learned Evaluation Form

LL Tracking No. _____

I. LESSONS LEARNED TITLE AND DOCUMENT NUMBER:	
Evaluation Priority:	Lesson Learned Document No. and Title:
Evaluation Due Date:	
II. TO BE COMPLETED BY SERVICE AREA EXPERT:	
Date Reviewed:	Service Area / Reviewer:
Lesson Learned Applicability:	
☐ Not Applicable ☐ Applicable—No Action ☐ Applicable—Action Plan Required	
Basis for Applicability:	
III. TO BE COMPLETED BY SERVICE AREA EXPERT, IF LESSON LEARNED IS APPLICABLE AND ACTION PLAN REQUIRED:	
Recommended Corrective Action(s):	
☐ Required Reading ☐ Immediate Physical Action ☐ Other	
☐ Procedure Revision ☐ Special Training	
Scheduled Completion Date:	
Facility Manager Concurrence:	
Comments, i.e., Procedure for Revision, Suggested Training Requirements:	
For Corrective Action(s), Select Affected Service Areas for Distribution:	
☐ W4000 Program Manager & Staff ☐ W4000 Total Quality & Training ☐ W4000 Environmental Coordinator ☐ W4010 Program Cntrl & Admin Mgmt ☐ W4010A Program Management ☐ W4010B Administrative ☐ W4020 Groundwater ☐ W4020A Central Groundwater Facilities ☐ W4020B Northern Groundwater Facilities ☐ W4020C Environmental Analysis	☐ W4030 Assessments ☐ W4030A Waste Site Investigation ☐ W4030B Remedial Assessments ☐ W4040 Closures ☐ W4040 Facility Management ☐ W4040A Hazardous Waste Closures ☐ W4040B Mixed Waste Closures ☐ W4070 Decon & Decomm ☐ All ERD ☐ Clerical
☐ Cost Accounts ☐ ERD Annual Briefing Only ☐ FEC and Alternative FEC ☐ HAZWOPERs ☐ Level 4 Managers ☐ NCR Initiation & Disposition ☐ Radiation Workers ☐ Section Procedure Coordinators ☐ STRs	
IV. CORRECTIVE ACTION CLOSURE/APPROVAL:	
Supporting Documentation (Attach Non Controlled Documentation):	
Approval:	Additional Approval (Training, etc.):
_____ _____ ERD Facility Manager Date	_____ _____ Date

Figure 2. Evaluation Form

For evaluations, two types of lessons learned exist—lessons learned received from sources external to the Environmental Restoration Department and lessons learned generated within the department and related support organizations.

Lessons learned received from sources external to the department are screened by the Environmental Restoration Area Lessons Learned Coordinator for potential departmental applicability. Those with potential departmental applicability are forwarded to the service area experts for evaluation and recommendation of appropriate correction action. Lessons learned generated within the Environmental Restoration Department or related support organizations are also screened by the Environmental Restoration Area Lessons Learned Coordinator for potential applicability to departments and divisions outside the Environmental Restoration Department. Identified lessons learned are forwarded to the division lessons learned coordinator for possible dissemination to the appropriate departments and divisions across the site.

CORRECTIVE ACTIONS

Service area experts recommend corrective actions for lesson learned applicable to their respective areas with concurrence received from management prior to implementation. Recommended corrective actions include required reading, special training, procedure revision and immediate physical correction.

Required reading is the most frequently used corrective action in the Environmental Restoration Department. Lessons learned with required reading corrective actions are distributed by the Environmental Restoration Department's Training Group to appropriate service area personnel either by hard copy distribution, electronic messaging or self-study guides. After reviewing the lessons learned, personnel complete a required reading review sheet. Lessons learned review completion is recorded and tracked by the Environmental Restoration Department's Training Group.

Development and coordination of special training, as well as support for all departmental training requirements, is provided by Environmental Restoration Department's Training Group. Procedure revision is accomplished through revision and comprehensive review of the procedure by management and representatives of affected service areas. Departmental procedures exist regarding procedure development, revision and review protocol.

Corrective actions requiring immediate physical correction are dispositioned by Environmental Restoration Department's Facilities Maintenance and Monitoring Group. One of Facilities Maintenance and Monitoring Group's primary functions is work control—requesting and scheduling work from supporting site maintenance organizations. Work is scheduled and performed on a priority basis, from routine to emergency. An example of immediate physical correction would be a corrective action resulting from a lessons learned involving incorrect or potentially hazardous drum storage configuration. The immediate physical action of the suspect configuration would be rearranged to the recommended configuration.

ENVIRONMENTAL RESTORATION DEPARTMENT'S LESSONS LEARNED DATABASE

A database was developed to catalog lessons learned applicable to environmental restoration/remediation activities at Savannah River Site. We developed the database utilizing site-licensed Macintosh software (FileMaker Pro) with pull-down screens and networking capabilities. Site-licensed software was chosen for personnel familiarity and posed no addition costs for implementation. By networking the database, personnel are able to access the database from any Macintosh connected to the network. Personnel enter the database in a read only mode and are unable to perform any changes.

Upon accessing the database, users are brought to a main menu screen shown in Figure 3. Users may then proceed to any of the four database screens, get application help or quit the database. Users selecting the user search button are sent to the user search screen shown as Figure 4. Here they search for search for appropriate lesson learned using a hierarchy of keywords. Keywords are obtained by selecting the specific keyword field and then pull down menus appear with the related keywords. Users access keyword definition screens (Figure 5, Database Keyword Definition Screen) by selecting the word under the keyword field.

Environmental Restoration's <i>Lessons Learned Database</i>	
Main Menu	
Search	Document Search
Criteria	LL Critique Criteria
Form	Suggestion Form
About	Database Information
Help	Application Help
Quit	Quit Database

Figure 3. Database Main Menu Screen

The database is based upon a hierarchy of keywords. Lessons learned entering the program are ranked and categorized by: rank, category, subcategory, waste unit, service area, waste and impact. Examples of each are:

- rank—site implementation, departmental evaluation, no action
- category—safety, regulatory, design, programmatic, documentation
- subcategory—employee, environment, equipment, RCRA, CERCLA
- waste site—basin, burial ground, landfill, pile, pit, tank
- service area—various management and specialized personnel groups
- waste—hazardous, non hazardous, mixed, sanitary
- impact—cost, schedule, technical

Environmental Restoration's
Lessons Learned Database

KEYWORD(S) Enter keyword(s) into the following field(s) to find record(s).

Rank

Category

Subcategory
(Safety and Regulatory Categories Only)

Waste Site

Service Area

Waste

Impact

REFERENCE DOCUMENT

LL Tracking No.

Title	Document No.	Date	Originator
Abstract			

Figure 4. Database User Search Screen

Initial training of Environmental Restoration Department and Department of Energy at Savannah River personnel for use of the database was accomplished through distribution of an information pamphlet. This pamphlet detailed the database's capabilities and technical contacts and described how to access the database through the site's computer network. Additional training, including presentations of the program and database, will be conducted at staff and special training meetings.

ENVIRONMENTAL RESTORATION LESSONS LEARNED PUBLICATION

The Environmental Restoration Department and the Department of Energy at Savannah River periodically publish a lessons learned publication with a distribution to environmental restoration/remediation departments across the complex. This publication identifies both positive and negative lessons learned experienced during environmental restoration/remediation activities at Savannah River Site. Readers may request further information relate similar experiences to Savannah River Site through a list of contacts in the publication.

[Return to Search](#) [Menu](#)

Environmental Restoration's
Lessons Learned Database

Key Words:

Event Category: Event category in descending order of importance.

Safety—an event with Safety concerns. Safety Category supersedes Design Category on In-House Events involving both Safety and Design.

Regulatory—an event resulting from or impacting regulatory issues or concerns.

Design—an event resulting from or impacting project Design; e.g., Value Engineering recommendations, new technology.

Programmatic—an event resulting from or impacting ERD programs, procedures or processes; e.g., streamlining processes or procedures, implementing new programs.

Documentation—an event resulting from or impacting documentation; e.g., records management concerns, project files, improved reporting methods.

Examples:

- A bulging drum could be Design, but an exploded drum injuring an employee would be Safety.
- A staging area unable to meet regulatory due dates and granted a waiver could be Regulatory, but a staging area exceeding regulatory due dates would be Programmatic.

Figure 5. Database Key Word Screen

CONCLUSION

At the Savannah River Site, we've recognized the benefits of a strong lessons learned program. We have developed a comprehensive database for cataloging lessons learned and we have placed it on the site's computer network to allow access by other organizations. Our program addresses safety, security, quality assurance, programmatic and technical events generated from environmental restoration/remediation activities in to reduce the recurrence of known events experienced by the department, site and related industry.

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