CONF-970537-- 4

FEMP-2539

COST AVOIDANCE TECHNIQUES THROUGH THE FERNALD CONTROLLED AREA TRASH SEGREGATION PROGRAM AND THE RIMIA SOLID WASTE REDUCTION PROGRAM

BY
CHARLES E. MENCHE

MAY 14, 1997

Fluor Daniel Fernald, Inc.*
Fernald Environmental Management Project
P.O. Box 538704
Cincinnati, OH 45253-8704

For Presentation at the
Annual Low-Level Radioactive Waste Management Conference
Salt Lake City, Utah, May 20-22, 1997

DISCLAIMER

*Fluor Daniel Fernald, Inc. With the U.S. Department of Energy under Contract No. DE-AC24-92OR21972

HH

COST AVOIDANCE TECHNIQUES THROUGH THE FERNALD CONTROLLED AREA TRASH SEGREGATION PROGRAM AND THE RIMIA SOLID WASTE REDUCTION PROGRAM

C. E. Menche
P.O Box 538704
Fluor Daniel Fernald[a]
(513) 648-5662

ABSTRACT

The Fernald Environmental Management Project is a Department of Energy owned facility that produced high quality uranium metals for military defense. The Fernald mission has changed from one of production to remediation. Remediation is intended to clean up legacy (primary) waste from past practices. Little opportunity is available to reduce the amount of primary waste. However, there is an opportunity to reduce secondary waste generation, primarily through segregation. Two programs which accomplish this are the Controlled Area Trash Segregation Program and the RIMIA Solid Waste Reduction Program.

With these two programs now in place at the FEMP, it has been estimated that a 60% reduction has been achieved in unnecessary "clean" waste being disposed as Low Level Waste at the Nevada Test Site. The cost savings associated with these programs (currently 79,000 cubic feet, $428,000) could easily run into the millions of dollars based on the upcoming restoration activities to be undertaken. The segregation of non-radiological waste in the radiologically Controlled Area not only establishes a firm commitment to send only low-level radioactive waste to the Nevada Test Site, but also results in substantial cost avoidance.

INTRODUCTION

The Fernald Environmental Management Project (FEMP) is a Department of Energy (DOE) owned facility that produced high-quality uranium metals for military defense for nearly 40 years. Fernald suspended production of uranium metals in 1989 and formally ended production in 1991. The Fernald mission has changed from one of production to environmental restoration. Even though the production days have ceased, the perception still exists that everything that enters the Radiologically Controlled Areas at the FEMP is automatically deemed Low Level Waste (LLW) and must be managed and disposed of as such.

---

a. Contractor for the U.S. Department of Energy's Fernald Environmental Management Project, under Contract No. DE-AC24-920R21972

This perception has caused a voluminous amount of non-contaminated waste to be disposed of as LLW at a substantial cost to the DOE. Clean waste is prohibited from disposal at the Nevada Test Site (NTS). With this in mind, Fluor Daniel Fernald initiated two programs to segregate and divert clean trash from the contaminated trash waste stream. These programs are the Controlled Area Trash Segregation Program (Green-is-Clean) and the Receiving Incoming Materials Inspection Area (RIMIA) Solid Waste Reduction Program. The following are further descriptions of these programs.

CONTROLLED AREA TRASH SEGREGATION PROGRAM (GREEN-IS-CLEAN)

The Green-is-Clean Program was initiated by Fluor Daniel Fernald in 1993. This program was developed in an effort to segregate office trash generated in the Radiologically Controlled Area in order to dispose of it as sanitary waste and minimize the quantities disposed as LLW. This program utilizes a combination of administrative controls and process knowledge to ensure the material meets the required release criteria prior to leaving the FEMP site. The administrative controls are threefold. First, Porter personnel and Radiological Control Technicians who are responsible for handling and surveying the trash receive specific training. Secondly, Radiologically Controlled Area personnel receive informal program overviews describing the methodology used to segregate the office trash. Thirdly, green-tinted trash bag liners are placed in each Controlled Area office trash can to indicate and identify approved areas in the Green-is-Clean Program.

The Controlled Area Trash Segregation Program began with a pilot program in April, 1993. Radiological Control Technicians radiologically surveyed 100% of all Controlled Area office trash. This was done to verify that process knowledge and administrative controls were sufficient to demonstrate "no rad added" and allow release of this waste to a sanitary landfill. Controlled Area office personnel were not informed of the pilot program to provide a worst-case scenario. Based on the results of these radiological surveys, an acceptable sampling plan that meets established acceptance criteria was established.

An appropriate sample size was chosen to meet the acceptance criteria. A reasonable lot

size was chosen that considers the practical aspects of lot holding times and segregation/storage requirements. The number of trash bags collected in a week was considered the lot from which the sample size is chosen. The actual number of items per bag varies considerably based on the bag's constituents. Past data has shown that this can vary anywhere from approximately 300 to 1000 items per bag. Because of this volume, a random sample is collected and radiologically surveyed per week to ensure a minimum number is met to satisfy the 95% confidence level. The remaining week's pickup is held until the sample population has been radiologically surveyed. If radiological contamination is detected in the sample, then the remaining population associated with that sample is disposed of as radioactive waste. Further steps are taken to identify the cause of the finding and corrective action is implemented to prevent reoccurrence of contaminated material entering the process.

A procedure has been issued to provide instructions to the Porter work force, Site Transportation, and Radiological Control Technicians. The procedure includes steps for collecting, packaging, radiologically surveying, transporting and disposing of non-contaminated Controlled Area office, break room and rest room trash. Based on the areas collected during the pilot program, Radiological Compliance issued an approved listing of Controlled Area offices, break rooms and rest rooms. The trash cans located in these approved areas contain a green trash can liner. This administrative control provides an indication to office area occupants and Porter personnel of the approved areas in the Controlled Area Trash Segregation Program. The Porter work force collects trash generated from these specific areas, package it in green-tinted translucent trash bags and indicate the building or area of generation directly on each bag with a permanent marker. These bags are placed in specific control points identified throughout the Controlled Area. Site Transportation collects the green bags twice weekly. A Radiological Control Technician accompanies Transportation on the collections and performs a visual inspection for prohibited items, radiologically surveys the outer surfaces of each trash bag, and randomly selects the number of bags to satisfy the sampling plan requirements. The contents of these bags are radiologically surveyed to provide confirmatory sampling results. If the contamination level meets the requirements for unrestricted release as specified in Radiological Control Department Procedures, the lot is disposed of as sanitary waste in a sanitary landfill.

Through the end of January 1997, the total cost savings associated with this program has already amounted to **$429,000**. The volume of trash segregated as non-radiological waste has amounted to over **80,000** cubic feet. It is estimated with the upcoming restoration activities to be undertaken at Fernald that the overall cost savings associated with this program could attain **millions** of dollars. By segregating the non-radiological waste, the FEMP establishes a firm commitment to send only LLW to the Nevada Test Site which results in a substantial cost avoidance.

RIMIA SOLID WASTE REDUCTION PROGRAM

The RIMIA Solid Waste Reduction Program was initiated by Fluor Daniel Fernald in February, 1995. This program was initiated to address the reduction of packaging materials delivered into the Controlled Area from the Receiving Incoming Materials Inspection Area (RIMIA) facility. A great deal of money is spent throughout the DOE complex every year due to the burial of dry compactible Low Level Waste at the Nevada Test Site that has not been confirmed to be radiologically contaminated. A major part of this type of waste consists of packaging material (e.g., cardboard and polystyrene) from packages delivered to the various sites. Fluor Daniel Fernald decided to concentrate it's effort on minimizing the amount of packaging material entering the FEMP Controlled Area. The probability of this waste becoming contaminated is relatively low, yet it is all managed as LLW once it enters the Controlled Area.

To identify means of reducing the amount of packaging waste being sent to NTS, the RIMIA on-site distribution and packaging process was assessed. One of the most workable methods to reduce the volume of packaging waste going to NTS was to capture as much packaging waste as practical at RIMIA before disbursing packages to the Controlled Area.

Virtually all packaging waste sent to the Controlled Area eventually was disposed of as LLW. Capturing packaging waste at RIMIA is now being accomplished through the utilization of reusable containers. This involves RIMIA Storeroom Attendants unpackaging certain boxed commodities, repackaging them into reusable containers for delivery to the specific Controlled

Area locations, and subsequently staging the accumulated packaging waste for recycling or disposal to a sanitary landfill. A Radiological Control Technician accompanies these shipments in order to assure the reusable containers remain clean and to observe any unpackaging of fragile commodities that may occur in the Controlled Area. These containers are plastic, some with collapsible sides, and come with lids in various sizes. After delivery to the specific Controlled Area locations, the empty reusable containers will be returned to RIMIA for subsequent reuse. In the event that these containers become contaminated, there are provisions to decontaminate them onsite prior to reuse.

A reusable container system is "most" beneficial in a closed-loop system. Many of the problems associated with returnable containers are the expense of tracking the containers, purchasing costs for the containers, loss or theft of the containers and the cost of backhaul to Receiving. Many of these issues are mitigated within Fluor Daniel Fernald by utilizing the above mentioned closed-loop system.

Since the program began in February 1995, the volume of trash segregated as non-radiological waste has amounted to **6,000** cubic feet which equates to **55%** of all packaging material destined for the Controlled Area. In addition, this equates to a cost savings of **$54,000**.

With these two programs now in place at the FEMP, it has been estimated that a **60%** reduction has been achieved in unnecessary "clean" waste being disposed as LLW at NTS. Minimizing the amount of packaging waste entering the Controlled Area also equates to a substantial cost savings by reducing the amount of LLW Fluor Daniel Fernald ships to NTS. As mentioned before, the Green-is-Clean Program has already proven substantial cost savings by segregating Controlled Area office, break room, and rest room trash from the contaminated trash waste stream. The overall cost savings from these two programs equates to approximately **$200,000** per year. With the increased activity due to implementation of remedial actions, the programs are expected to save even more money in the long-term. The Green-is-Clean and the RIMIA Solid Waste Reduction Programs are components of the near-term investment Fluor Daniel Fernald and DOE are making to realize a sustainable, cost effective program with long-

term savings.

COPYRIGHT STATEMENT

LEGAL DISCLAIMER