LESSONS LEARNED DURING THE D & D
OF FERNALD PLANT 7

Gerald P. Motl
Terry D. Borgman

January 14, 1994

FERMCO
Fernald Environmental Management Project
P.O. Box 398704
Cincinnati, Ohio 45239-8704

For Presentation at the
ANS Annual Meeting
New Orleans, LA
June 19-23, 1994

Session 12.8 "Plant Decommissioning and
Reactor Site Cleanup: Restoration of
Nuclear Facility Environments"

FERMCO with the U.S. Department of Energy under Contract
No. DE-AC-05-920R21972

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED
INTRODUCTION

The Fernald Environmental Management Project (FEMP), formerly the Feed Materials Production Center (FMPC), is a Department of Energy (DOE) site which produced high-quality uranium for military defense beginning in 1951. Production at the FEMP was halted in July 1989. Later that year, the facility was placed on the National Priorities List (NPL).

PLANT 7 DESCRIPTION

Plant 7 was constructed in 1953 to house processes for the reduction of uranium hexafluoride ($Uf_6$) to uranium tetrafluoride ($Uf_4$). The plant operated only for a period of two years. In 1993, the USEPA approved a removal action to dismantle the structure to grade level to eliminate hazards associated with the building Asbestos Containing Material (ACM), bird droppings (a biological hazard), and uranium contamination.

Plant 7 is the tallest, most visible structure at the FEMP measuring 80 feet x 110 feet x 110 feet high (seven stories). Plant 7 is made up a structural steel frame enclosed by transite wall and roof panels. Transite is an ACM. The second and the ground floor are concrete slabs with the remaining floors made up of steel decking. Radiological surveys conducted within Plant 7 in May 1992, detected removable alpha and beta-gamma contamination as high as 33,253 dpm/100cm² and 73,296 dpm/100cm² respectively.

DECONTAMINATION AND DECOMMISSIONING (D&D)
The D&D of Plant 7 was initiated in June 1993, following EPA approval of the removal action work plan. The project is expected to be completed by November 1994. Major C&W milestones are as follows:

<table>
<thead>
<tr>
<th>Month</th>
<th>Task Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 1993</td>
<td>Bidders pre-qualification</td>
</tr>
<tr>
<td>July 1993</td>
<td>Invitation for Bid (IFB) issued to pre-qualified subcontractors (completed)</td>
</tr>
<tr>
<td>September 1993</td>
<td>Pipe asbestos removal (completed)</td>
</tr>
<tr>
<td>October 1993</td>
<td>Plant washdown (completed)</td>
</tr>
<tr>
<td>November 1993</td>
<td>Contamination lockdown (completed)</td>
</tr>
<tr>
<td>November 1993</td>
<td>Dismantlement subcontract award (completed)</td>
</tr>
<tr>
<td>January 1994</td>
<td>Removal of HVAC ductwork, piping, electrical, and remaining equipment</td>
</tr>
<tr>
<td>February 1994</td>
<td>Interior transite siding removal</td>
</tr>
<tr>
<td>May 1994</td>
<td>Exterior transite siding removal</td>
</tr>
<tr>
<td>August 1994</td>
<td>Structural steel removal</td>
</tr>
<tr>
<td>February - October 1994</td>
<td>Waste recycling/disposition</td>
</tr>
<tr>
<td>November 1994</td>
<td>Demobilization</td>
</tr>
</tbody>
</table>
The status of completed D&D milestones are as follows:

Bidder Pre-qualification

Pre-qualification packages were issued to prospective bidders in June, 1993 since bids would be accepted only from pre-qualified organizations.

The criteria established for pre-qualification were the following:

1. Rigging experience
2. Government/DOE work experience
3. Radiation safety experience
4. Safety record
5. Demolition experience
6. Prime contractor commitment (40% minimum by prime)

Dismantlement Subcontractor IFB

The IFB was issued to potential dismantlement subcontractors on July 28, 1993. A total of 49 individuals representing 24 organizations attended a pre-bid meeting on August 9, 1993.

Pipe Asbestos Removal

In September 1993, the Fernald workforce completed the removal of asbestos insulation from approximately 3400 linear feet of pipe and two (2) large HVAC units. In addition, 400 square feet of asbestos containing floor tiles were removed. A total of 3600 cubic feet of contaminated asbestos containing material was removed.
Plant Washdown

Plant 7 was "washed-down" to reduce overall building contamination levels to prevent the spread of contamination and to allow, but not necessarily, utilize a lower level of personal protection equipment (PPE). A high-pressure power washer was used to wash all building interior surfaces. Washdown liquid was allowed to move by gravity to a sump in the ground floor. Approximately 10,000 gallons of washdown water was collected in three (3) 5000 gallon storage tanks prior to treatment in Fernald's Plant 8 water treatment system.

Contamination Lockdown

Following washdown, a .5 mile layer of acrylic latex paint was applied to all interior building surfaces to "lockdown" any remaining loose surface contamination. Approximately 700 gallons of paint was used to cover 1.4 million square feet of interior building surface area. Average alpha and beta contamination levels were reduced to 36 and 179 dpm/100cm², respectively.

Dismantlement Subcontract Award

The Plant 7 dismantlement contract was awarded to the Project Development Group (PDG) in November 1993, based on receipt of the lowest qualified bid. A total of 9 responsive bids were submitted by 14 pre-qualified bidders.

Other activities occurring between January through June 1994 will be addressed during paper presentation.
LESSONS LEARNED

Although the D&D of Plant 7 is not yet completed, a number of valuable lessons/insights have already been gathered:

1. **The Dismantlement Market is Competitive.** The strong, sound bid response from 9 pre-qualified bidders indicates that the infrastructure is in place to handle an expanding D&D market. In fact, a range of competitive bids were received that were only half of the pre-IFB cost estimate completed by Fernald.

2. **Contractors Often Have a Better Idea.** The Fernald IFB envisioned building dismantlement utilizing a large-lift method - essentially cutting and removing one floor at a time. The winning bid proposed a technique different and substantially less costly from that suggested by Fernald.

3. **Washdown/Lockdown is Very Effective.** The washdown/lockdown procedure was extremely effective in reductive removable contamination levels - by a factor of 15. It is anticipated that employee and subcontractor safety goals will be achievable at a much reduced project cost and with an acceleration of project schedule.

4. **The DOE Work Environmental is a New Experience for Many Demolition Subcontractors.** In general, it appears that subcontractors, even with excellent work experience, are surprised by the stringent documentation and oversight requirements that are present on DOE projects.

5. **Dismantlement Bid Specifications should "Spec" Standard Industry Construction Equipment.** Following bid receipt, it becomes obvious that, in many cases, standard construction equipment was readily available that
exceeded the "customized" requirements contained in the bid specification.

By being aware of industry capabilities, bid spec preparation should be cheaper and faster with a better technical result.

Additional lessons learned will be presented as the D&D effort of Plant 7 progresses.
Disclaimer

This paper was prepared as an account of work sponsored by an agency of the United States government. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not constitute or imply its endorsement, recommendation, or favoring by the United States government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States government, or any agency thereof or Fernald Environmental Restoration Management Corporation, its affiliates or its parent companies.