

779 CLOSURE PROJECT - THE FIRST PLUTONIUM FACILITY AT ROCKY FLATS

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INTRODUCTION

Rocky Flats is scheduled to close in 2010 with an ongoing effort to accelerate to 2006. The 779 Closure Project was the first large plutonium facility to be decommissioned and demolished at Rocky and in the United States. It has streamlined the techniques to be employed in the subsequent plutonium contaminated facilities.

The Project included the main facility and several support facilities, such as filter plenums and diesel generator stations, for a total of 68000 square feet. It was moderately contaminated with beryllium and contained approximately 5 kg of plutonium holdup distributed in the ventilation and in 123 glove boxes and hoods.

The end state of the project was to remove all structures to their concrete pads. The final pad removal will be completed during soil remediation

ORGANIZATIONAL APPROACH

This Project was performed under the Kaiser-Hill integrator. A special teaming agreement was formed with Safe Sites of Colorado (Westinghouse and Babcock and Wilcock) and Rocky Mountain Remediation Service (Morrison and Knudsen and British Nuclear Fuel).

The organization was tailored for a project approach with a clear line of responsibility and configuration control on work release. Classical operations positions, such as facility manager, operations manager, shift manager, shift technical advisor, etc. were eliminated. In the new structure all work was released by the Work Authorization Team Leader.

INTEGRATED SAFETY MANAGEMENT

Integrated safety management occurred at three levels: 1) the Integration Manager, 2) the Work Authorization Team Leader, and 3) the workers.

ISM at the Integration Manager level began before the project execution and continued throughout the project. The proposed technical approaches were discussed with the workers and with the regulators in scoping meetings. The Health and Safety Plan described the risks and controls. Finally, the formal public approved Decommissioning Operations Plan defined the entire package and was necessary for authorization to begin decommissioning. During the execution phase the Integration Manager defined the work to complete over the next week and month.

ISM at the Work Authorization Team Leader level authorized the final work scope to be performed by integrating the planned work from the Integration Manager and the feedback from the workers in the Plan of the Day. The hazards defined in the Health and Safety Plan and any new potential hazards were discussed. The Work Authorization

Team Leader ensured that the proper surveillances had been performed and that the activities were within the authorization basis. He then authorized work to be released.

ISM at the worker level is identical to Enhanced Worker Planning. Teams of workers, engineers, etc. were assigned specific workscope over the length of the project. They were responsible for determining the approach to complete the scope and ensuring that all hazards were defined and properly controlled. They executed the work after authorization from the Work Authorization Team Leader.

INTEGRATED PROJECT APPROACH

This project was scheduled for completion in three years in the 2010 plan. It is currently on schedule for completion in two years to support the 2006 closure.

The project defined its work scope by the logical sequencing of the removal of hazards to achieve the end states. There were discrete phases of hazard removal that overlapped: Category I plutonium, excess chemicals, property, holdup in glove boxes, holdup in ventilation, and remaining structures. The distinction between deactivation and decommissioning is pure semantics and did not serve any useful purpose to the project. Its value was in defining the demarcation of responsibilities between different sections of the customer or the regulators.

The reality of closing facilities in a DOE complex is that the project begins with a snapshot of the existing conditions: little up front planning, inadequate maintainance, little quantitative characterization, and an authorization basis that has not been designed for project closure. The challenge was to do real hands on work continuously while everything is corrected in parallel. This required an emphasis on properly segmenting the work scope and on contingency planning.

Property utilization and disposal was planned as contingency work. A high emphasis was placed on preventative maintenance of the vital safety systems, such as ventilation. This also served as contingency work. Segmentation was defined with careful attention to blocks of work that could be performed within the current authorization basis, that afforded undisputed definition of hazards, and that represented a reasonable step up in complexity from work previously completed by the workers. The sequencing of glove box removal can be used as an example: The State gave the project approval to remove the first 9 glove boxes prior to the approval to the Decommissioning Operations Plan. They had to be essentially uncontaminated and not connected to the ventilation. They were used for training boxes for all the removal teams. The next thirty glove boxes were done after the State approved the DOP and after two relatively simple page changes to the old authorization basis. A ventilation test was designed to ensure all parties that this safety system would not be compromised. A second ventilation test was done for the next 30 glove boxes. Finally, the project had to demonstrate that the new authorization basis was implemented in order to complete the final glove box removal. Work was done continuously over this time frame.

The Management Reviews were also conducted in sequence to correlate with this segmented approach for the following activities: the entire program, the first thirty glove boxes, the next 30 glove boxes, the new authorization basis, the B annex ventilation, the demolition of the 729 filter plenum building, the entire ventilation system, and the demolition of the remaining complex.

Safeguards and security were also phased. After removal of the Category I and II plutonium, the Material Access Area was closed. Analysis was completed to allow the building to be declared a Category IV safeguards facility. (While it still remained a Category II nuclear facility.) After completion of the required Security plan a temporary fence was constructed allowing the facility to be used by uncleared workers. (This was important to reduce the cost of the building trade asbestos removal teams.) Using the safeguards plutonium characterization data, the highest concentrations of plutonium were selectively removed and safeguards was terminated from the facility.

Criticality safety calculations were made proving that a criticality was incredible. This allowed the removal of the criticality alarms and the removal of the Limits of Operation required by the authorization basis.

NEW APPROACHES

Property Utilization and Disposition Four changes were made to this program, all within the DOE requirements: 1) A 100% sampling requirement was required for all material in the free release area of this facility (23 contaminated items were discovered.); 2) Economic disposition analysis was done on 15 categories of items rather than on 5000 individual items; 3) Item inventories were completed "just in time" as they were shipped or disposed rather than all up front; and 4) Requests for interest in the available equipment were made all at once rather than in a "pecking order" series. Actual priority transfer was made in the proper order.

Beryllium Beryllium contamination was discovered during the first survey. All operations were stopped and over 1000 surveys were taken in the facility. All results were posted and displayed in a color coded facility map. All levels above 10 microgram per square foot were decontaminated. The Health and Safety Plan was modified and an operations order was issued requiring the use of respirators in any unsampled areas. When equipment was moved, wet wiping was done and new samples were taken. The project insisted on an "Assume it is there!" approach.

Authorization Basis A new authorization basis document was produced, the Nuclear Safety Technical Report, which was specifically tailored for closure. As hazards were removed, the control sets were removed automatically.

TECHNICAL APPROACHES

All of the technical approaches were devised with an overriding emphasis on reduction of airborne contamination.

Glove box Removal All boxes were characterized by safeguards and radiological techniques. Work packages were completed and approved. The lowest risk boxes were removed first and used as a training vehicle. All loose material was removed and the surface wiped and sprayed with a fixitant. All systems except ventilation were disconnected. The box was size reduced by mechanical means and placed in the proper waste crate. Ventilation was closed or valved through a filter.

Ventilation Removal The system was characterized via safeguards techniques. Fixitant spray was applied. Ducts were mechanically removed in sequence toward the filter plenums. The three ventilation systems were removed in order of increasing complexity.

Demolition A new State document was written for public approval. A small filter plenum building was removed first to make all interested parties comfortable with the approach. The first step was a detailed characterization in one meter square grids. Any internal contamination that would prevent free release was removed by scabbling techniques. Any remaining non structural walls were internally demolished using the building as an effective containment. The final demolition was completed with an emphasis on minimum dust, i.e. non explosive techniques, weather restrictions, and water misting.

SUMMARY

The 779 Closure Project has demonstrated that it is feasible to beat the sites current Ten Year Plan. New techniques and processes were demonstrated are providing a baseline for the next project - The 771 Closure Project.