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Preliminary Assessments
The Shortcut to Remediation
(Category III—Surplus Facility Assessments)

Environment, Health, and Safety Concerns

To protect the public health, provide safe working conditions for employees, and mitigate potential environmental impacts, it is important to remove radioactive and hazardous source materials as soon as possible after operations cease. Los Alamos National Laboratory (the Laboratory) begins planning for decommissioning a facility when the building is first declared surplus. We evaluate risks and rank facilities according to environmental and safety risk. By beginning the planning process early, we are able to take advantage of the facility's operational expertise while it is still available, and we can plan safer, more expeditious decommissioning projects. The early planning process also helps us to be ready to start decommissioning as soon as funding is available. Our early planning seeks to identify the boundaries of decommissioning hazards without necessarily fleshing out all the details within those boundaries.

Economic Considerations

The Laboratory has currently identified 97 surplus contaminated facilities. Each of these facilities must be in a constant surveillance and maintenance (S&M) program to ensure that they remain in a safe condition and do not release contaminants to the environment. At present, the budget for this S&M is provided by the Defense Programs of the Department of Energy (DOE). The DOE Facility Transition and Management Office (EM-60) is planning to provide a portion of this budget beginning in FY96.

Good stewardship of taxpayer resources, as well as good housekeeping practice, dictates that these facilities be decommissioned as soon as possible. Eliminating unnecessary characterization both serves this purpose and achieves direct savings. The cost of additional characterization should always be weighed against the health and safety benefits accomplished by that characterization. Sometimes eliminating risk quickly is the best choice from both an economic and a safety viewpoint. In addition to saving S&M costs and avoiding excessive characterization costs, early decommissioning saves costs incurred by escalation.

Reducing Transition Time

As an alternative to long-term surveillance and maintenance of surplus facilities, we prefer to invest in a preliminary assessment that will lay the foundation for our decommissioning plan and
increase the probability of early funding. Our goal is a plan that has enough definition to be
implemented right away while providing enough flexibility to allow a future contractor to
implement new ideas and technologies as they become available. Toward this end, we structure the
requirements of our preliminary assessment contracts to produce the following deliverables:

Preliminary Characterization Report

The idea here is to provide enough information to plan a safe decommissioning project, not to
analyze all the constituents of every contaminant. Existing documents, such as operational
radiological surveys, asbestos surveys, hazardous material surveys, operating records, and
construction drawings, are collected and examined to establish the known conditions and to
determine the need for additional sampling and surveys. Often additional sampling can be done
within the scope of the preliminary assessment.

Sometimes further characterization is necessary, but it can be specific and limited to the areas of
greatest concern. In some cases, it is necessary to characterize waste streams as they are
segregated, but such characterization is simple and inexpensive compared with characterization in
place. For most buildings at Los Alamos, preliminary characterization is adequate for
decommissioning.

Preliminary Project Plan

The preliminary project plan establishes the scope, schedule, and budget for the decommissioning
project. It also describes the decommissioning alternatives considered, the advantages and
disadvantages of each, and the recommended alternative. This is the document that forms the basis
for the baseline information provided in the budget request. Having this information early in the
planning stage makes our baseline budget much more defensible and less subject to arbitrary
reduction. The project plan then becomes a living document that can be updated as the project
progresses.

Health and Safety Plan

This document identifies the hazards and plans for mitigating them during decommissioning. It
provides for task hazard analyses and a work-permitting procedure to address hazardous
operations that could arise at any time during the project. It expands as contractors are added to the
project and as tasks are better defined. We want to be careful that the health and safety plan does
not dictate methodology but ensures that whatever methodology chosen is properly analyzed and
planned for safe implementation.

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Quality Assurance Project Plan

We stress going beyond data quality to consider all aspects of a decommissioning project. The quality assurance project plan establishes the organization, responsibilities, controls, and interfaces for the quality assurance (QA) of the entire project team. The project team determines a graded approach that applies management controls to each activity based on the following criteria:

- consequence of failure,
- probability of failure,
- data liability,
- complexity,
- special controls,
- ability to demonstrate functional compliance,
- quality history,
- degree of standardization, and
- impact on schedule and/or cost

On decommissioning projects, a close relationship often exists between health and safety controls and QA controls. For efficiency, it is important not to duplicate controls, but it is even more important to establish communications between the two disciplines to ensure that neither quality nor safety is compromised.

Surveillance and Maintenance Plan

This plan includes cost estimates that can be used as part of the argument for rapid decommissioning. It also must be a plan that can be implemented until decommissioning is completed.

Waste Management Plan

It is important to ensure acceptance of waste, identify waste minimization measures, and accurately project cost of waste handling and disposal. A vital component of this plan is the estimate of waste volume. An accurate estimate of waste volumes aids in getting commitments for onsite disposal space, if available, or in starting the process and assessing the cost of offsite disposal. Accurate estimates of waste volumes by waste streams can also aid in assessing waste minimization measures.
Characterization Plan (if necessary)

We emphasize keeping characterization to a minimum. If further characterization is deemed necessary, the plan can be specific. Using this method, we expect that the characterization phase of future projects will not exceed 3 months.

Environmental, Health, and Safety (ES&H) Checklist

Using an ES&H checklist ensures that the project is reviewed for ES&H concerns by appropriate Laboratory personnel. Completing the checklist triggers the start of the process specified in the National Environmental Policy Act (NEPA), initiates evaluation of historical buildings, and identifies necessary permits and other compliance issues.

Results

We have used the preliminary assessment approach to develop the following four decommissioning projects at the Laboratory:

HE-Contaminated Buildings

These buildings consist of 25 WW II vintage buildings located in the technical area that was used for processing, testing, and storing high-explosive (HE) materials. These materials were abandoned in the late 1950s and have been under Laboratory-funded surveillance and maintenance ever since. The facilities are eligible for the National Register of Historic places. Before decommissioning could proceed, an historic survey and evaluation, followed by a memorandum of agreement between the DOE and State Historic Preservation Officer, had to be prepared, and mitigation measures had to be completed.

The memorandum of agreement required large-format photographs, measured drawings, and documentation of the history of the site and each individual building. One building, a guard station, will be decontaminated and restored as an historic symbol of when Los Alamos was a closed city. Our preliminary assessment identified the need for these activities early in the project. They were performed in parallel with our preliminary characterization and avoided a delay in starting decommissioning.

The methods used for preliminary characterization were:

- review existing documents regarding the subject buildings;
- collect and review engineering drawings;
- collect existing photographs;
- interview past and present site personnel regarding history, use, and condition of buildings;
collect existing asbestos surveys for the buildings;
visually inspect the buildings;
perform radiological surveys using exposure rate meters, count rate meters, beta-gamma detectors, and large-area floor and wall swipes;
perform field spot tests for HE contamination; and
perform field spot tests for lead-based paint.

The hazards identified in these buildings were HE residue, asbestos, lead-based paint, potential for hantavirus in rodent droppings, physical hazards caused by deteriorating structures, and a small amount of radiological contamination. We determined that these hazards could be safely managed during the decontamination and demolition of the buildings and that no further characterization was necessary.

This is a project in which the hazard levels had been greatly exaggerated because of the length of time the buildings were vacant. The estimate for decommissioning before the preliminary assessment was almost $40 million, and the schedule spanned 4 years. The baseline cost developed by the preliminary assessment is $4.1 million, and the completion time is 2 years. As a result of better project information, we have been able to obtain funding and move right into remediation activities. Seven of these buildings will be demolished this year, and the remainder will come down in FY96.

High-Pressure Tritium Facility

This high-pressure tritium facility, constructed in 1955, was used for packaging and handling tritium gas for Laboratory experiments. The facility has been shut down for over 3 years, and all process tritium has been removed.

The methods used for preliminary characterization were

- review existing documents regarding the subject building;
- collect and review engineering drawings;
- collect existing photographs;
- interview past and present site personnel regarding history, use, and condition of building;
- collect existing asbestos surveys for the building;
- visually inspect the building; and
- collect existing radiological survey results. It was not necessary to do additional radiological surveys.

The hazards associated with the building are high-pressure gases, heavy equipment that must be removed, radiological contamination in two rooms from tritium experiments, small amounts of...
mercury and oil contaminated with tritium, and some experimental circuit boards that may contain hazardous waste as defined by the Resource Conservation and Recovery Act.

This decommissioning project has been baselined and is scheduled to start in FY98 after a sitewide environmental impact statement has been completed. No further characterization was deemed necessary.

**Omega West Reactor**

The Omega West Reactor is an 8-MW research reactor used for a variety of Laboratory experiments. The facility was constructed in 1943 and has housed five nuclear reactors between 1944 and 1995. In 1992, when a leak was discovered in an underground coolant line, the reactor was shut down and never restarted. The facility was declared surplus in FY95, the reactor was defueled, and all control blades were removed, which placed the facility in a safe-shutdown mode of operation. We began preliminary assessment in January 1995.

Because the building is eligible for historic preservation, we began documentation right away. At the same time, we began seeking a preliminary NEPA determination so that we could begin an environmental assessment, if necessary.

The methods used for the preliminary characterization of this facility were

- review existing documents regarding the subject facility;
- collect and review engineering drawings;
- collect existing photographs, including photographs of original construction;
- interview past and present site personnel regarding the history, use, and condition of the facility;
- collect existing asbestos surveys for the facility;
- visually inspect the facility;
- collect results of past radiological surveys;
- perform radiological surveys inside the reactor vessel using a digital ion chamber probe;
- core the floor in the vicinity of historical reactor locations; and
- analyze the concrete and soil using gamma spectroscopy.

Some further characterization will be necessary, but we have enough information to plan the decommissioning baseline, start the NEPA process, evaluate historical buildings, and begin planning for waste disposal. Decommissioning the Omega West Reactor is now scheduled for FY97 and FY98 at a cost of about $15 million.
Thirty-five additional surplus buildings, in which the primary hazards are HE residue and a small amount of radiological contamination, are located at various technical areas around the Laboratory. One objective of our preliminary assessment of these facilities is to group them appropriately in discrete decommissioning projects that can be sized to match available future funding.

**Conclusion**

By starting preliminary assessments for surplus facilities as early as possible, we are able to establish a realistic decommissioning baseline, identify and attack the roadblocks, and be ready to move directly into the remediation phase as soon as funding is available. Our experience demonstrates that a relatively small amount of up-front funding for these activities can greatly reduce the time required to get to remediation.