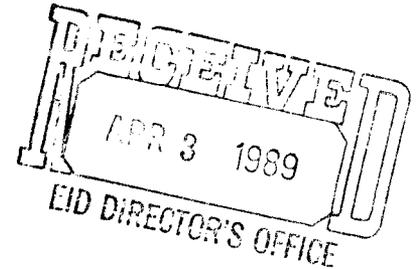




Department of Energy
Albuquerque Operations
Los Alamos Area Office
Los Alamos, New Mexico 87544

MAR 30 1989

CERTIFIED MAIL - RETURN RECEIPT REQUESTED



Mr. Richard Mitzelfelt
Director
N. M. Environmental Improvement Division
1190 St. Francis Drive
Santa Fe, New Mexico 87503

Dear Mr. Mitzelfelt:

In response to the Environmental Improvement Division's (EID) letter dated October 6, 1988, enclosed is the Los Alamos National Laboratory's (Laboratory) long-range plan for managing certain compressed gas cylinders. These cylinders cannot be returned to the manufacturer because they cannot be shipped in accordance with Department of Transportation regulations.

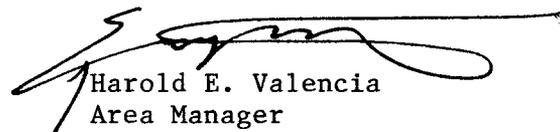
The Laboratory previously disposed of these cylinders by explosive detonation at one of its remote test sites. However, since 1987, we have been seeking other means of disposal. Other Department of Energy (DOE) sites have similar disposal problems and are encouraging the Laboratory to develop a DOE-wide solution.

The Laboratory is currently in the process of trying to obtain or develop a technology for recontainerizing the contents of gas cylinders. We expect to have an operating recontainerization process by late 1991.

Since the last detonation of gas cylinders in 1987, the Laboratory has accumulated a number of gas cylinders. Some of these cylinders are so deteriorated that it is unsafe to delay disposal until the recontainerizing process is operable. Therefore, the Laboratory has scheduled a series of cylinder detonations over the next few months, beginning the last week of March.

If you have any questions, please call Donna Lacombe at 667-5288.

Sincerely,


Harold E. Valencia
Area Manager

Enclosure

LTP:DML:(3/30)



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TC

LOS ALAMOS NATIONAL LABORATORY
LONG-RANGE PLAN
FOR DEVELOPING A GAS CYLINDER DISPOSAL PLAN

I. INTRODUCTION

Many DOE contractor sites urgently need a practical method of handling and disposing of the contents of leaking or damaged cylinders or cylinders whose contents are unknown. Currently leaking cylinders are allowed to vent where they are found or at a remote location. Damaged and unknown cylinders are placed in long-term storage pending disposal. Occasionally, the cylinders are vented to the atmosphere by detonation with explosives. Safety considerations and environmental regulations will soon make these practices unacceptable.

In FY87, LANL conducted a study to find remedies to the gas cylinder problems. The study included a literature search and a survey of vendors of gases and gas cylinders for available handling technology and gas treatment methods. Knowledge gained from these tasks was included in a logic diagram for disposing of gas cylinders; the process involved two major operations: (1) recontainerizing leaking, damaged, and unknown gas cylinders and (2) treating waste gases. Conceptual process designs were developed for both operations. A list of candidate gases was prepared that included cylinder and treatment information on 136 gases that could be repackaged and treated using the two processes. This proposal covers only the development of the process for gas cylinder recontainerization.

Based on literature searches and inquiries into gas recontainerization technology, LANL proposes the following course of action for the remainder of FY89:

1. Determine the rights of Integrated Environmental Services (IES) of Atlanta, Georgia, to the sale of process or license of the design for the recontainerization technology. IES is coholder of patent rights to the Earth Resources Corporation (ERC) process. Negotiate the most flexible purchase/licensing agreement through ERC or IES, as appropriate.
2. Should the ERC/IES license/purchase agreement be too restrictive to fulfill programmatic needs, proceed with the LANL design of an alternative recontainerization process.
3. Follow up on technology developed by Emergency Technical Services Corporation (ETSC) of Schaumburg,

Illinois, for overpack recontainerization for future use in emergency response.

4. Evaluate the ETSC's treatment technology as a future resource for disposal capabilities for recontainerized gas cylinders.

Based on the FY89 assessment of available alternatives, LANL believes that the ERC/IES technology is the only viable process option in the near future. After resolving the outstanding patent/purchasing issues, LANL therefore intends to proceed with procuring this technology in FY90. The most logical purchasing path to follow now is to enter into a lease/purchase option.

Beginning in FY90, LANL will therefore seek funding to lease/purchase the recontainerization technology. Purchase of the prototype process and performing the initial testing are scheduled to begin in FY90. Prototype testing and documentation are to be completed in FY91. FY92 and FY93 lease extensions are required to complete the purchase of the unit.

II. DESCRIPTION OF THE RECONTAINERIZATION TECHNOLOGY

The recontainerization process allows for gas sampling and analysis and repacks the gas into new cylinders. Once identified and in a good cylinder, the gas can be stored or transported, which increases the number of treatment options.

Treating gas is a separate operation from recontainerization. Thus, the only residuals created are any rinsing fluids from cylinder decontamination when required to ensure that the cylinder poses no threat to human health or the environment.

The recontainerization module consists of a pressure vessel into which a problem cylinder is placed. The pressure vessel can be purged with an inert gas or be evacuated with a vacuum pump. After the atmosphere in the pressure vessel has been prepared, a hole is drilled in the side of the problem cylinder with a hydraulically driven, remote-controlled drill within the pressure vessel. The contents of the cylinder are then vented to the pressure vessel, where the gas can be held for sampling and analysis, then compressed into new cylinders. The gas cylinder can be rotated and a second hole drilled to allow liquids to be drained from the cylinder into a new cylinder.

Proven recontainerization technology is available from ERC, which has developed a process for recontainerizing gas cylinders at CERCLA sites. ERC's recontainerization process is well designed and constructed but is specifically

designed to campaign a large number of cylinders. As such, the recontainerization module and support equipment take up an entire semitrailer. The DOE facilities must have a small mobile module that can be quickly moved to the location of a leaking cylinder and contain it so that it can be safely moved.

No other proven alternative is available. The accumulation of damaged and unknown gas cylinders for a campaign by ERC creates a safety hazard because the cylinders cannot be fully controlled in storage. Recontainerization by an off-site subcontractor does not address quick containment of leaking cylinders, and, until ETSC perfects its overpack technology, damaged cylinders cannot be safely shipped.

III. WASTE INFORMATION

The waste consists of pressurized gas cylinders of varying sizes. Cylinder contents can range from inert gases to toxic and pyrophoric gases. Recontainerization is specifically required for leaking, damaged, or unknown cylinders.

Damaged cylinders include cylinders with valves that will not open or corroded cylinders deemed unsafe for transport. Often the valves on corroded cylinders cannot be operated because the overall condition of the cylinder suggests that an increased risk of valve failure would endanger personnel.

Unknown cylinders include cylinders with no markings to identify the contents or cylinders used in such a way as to make available markings questionable. The risk of handling unknown cylinders increases if the cylinder is also damaged. LANL generates 10 to 12 damaged or unknown cylinders in a year, and the rate is expected to increase rapidly as remedial action is taken at CEARP sites.

IV. BY-PRODUCT INFORMATION

No by-products are formed.

V. SCHEDULING INFORMATION

Remaining FY89 activities include investigating IES patent rights and capabilities, determining which vendor to pursue for procurement of the modified gas recontainerization process, and resolving what method of subcontracting to employ.

FY90 activities will include the purchase of the process through ERC or IES. LANL can exercise a purchase option to obtain the recontainerization equipment from ERC or can negotiate a purchase option through IES. Purchase of the equipment from ERC allows some acceleration of the set-up

and run-in of equipment; the testing of the drilling operation on empty cylinders should be completed in FY90.

Completion of prototype testing on pressure cylinders, documentation, and technology transfer will be completed in FY91.