

October 1988

ARMY  
PROCUREMENT

Procurement of a  
Newly Designed Steam  
Cleaner Is Premature



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**National Security and  
International Affairs Division**

B-223673

October 19, 1988

The Honorable Dave McCurdy  
House of Representatives

Dear Mr. McCurdy:

As you requested, we reviewed the Army's procurement of a new, military-designed, standard steam cleaner to be used for cleaning vehicles and heavy equipment with steam or high-pressure water. We believe that procurement of the steam cleaner is premature because the Army has not adequately demonstrated a need for its capabilities, has not developed a doctrine specifying how it will be used, and has not completed its evaluation of recently concluded tests on the cleaner's reliability.

The standard steam cleaner is intended to solve operational and reliability problems the Army has encountered with commercial steam cleaners. It consists of a newly designed steam cleaning unit and a standard military 3-kilowatt electric generator mounted on a standard military trailer. The generator and trailer allow the Army to use the cleaner in the field. The estimated cost of a standard steam cleaner is \$15,767—\$8,970 for the cleaning unit, \$5,273 for the generator, and \$1,524 for the trailer.

The Army currently uses commercial steam cleaning units and in March 1987 bought 729 cleaners for about \$2,100 each. Unlike the military standard cleaner, the commercial cleaners purchased by the Army do not have automatic features for draining water and removing deposits from the heating coil and have not been mounted on trailers with generators.

Although the Army's stated requirement is 6,338 standard steam cleaners, it plans to buy, because of budget constraints, only 495 cleaners and trailers through fiscal year 1994. The Army awarded a contract in September 1987 to buy the first 325 cleaners, and deliveries are scheduled to begin in February 1989. The Army plans to buy another 170 cleaners during fiscal year 1989.

Our objectives, scope, and methodology are discussed in appendix I.

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## Army Has Not Adequately Justified Need for Standard Steam Cleaner

The Army has not adequately justified the acquisition of the standard steam cleaner. According to Army officials, the need for the standard steam cleaner, including the generator and trailer, is based on a 1976 test report and a 1978 requirements justification document. These documents do not support the need to acquire standard equipment. Less expensive commercial units may be available to meet the Army's minimum needs.

The 1976 report basically described the results of a test that compared the performance of five commercial cleaning units in various modes of operation, including high-pressure steam cleaning, with manual cleaning. Not surprisingly, it concluded that steam cleaning was more effective than manual cleaning. In addition, the report recommended that the Army develop a mobile cleaning system with its own electrical power source.

We found no factual support in the report for this recommendation. The report does not indicate that any comparative analysis was made of the cost differential and effectiveness of commercial units and a standard military designed unit. Nor does the report present any analysis of the benefits that will be derived from having a cleaner supported by a generator and trailer versus a skid-mounted cleaner supported by available power sources. Finally, the report does not contain any information on the need for special features, such as the automatic draining and cleaning capability that was built into the military unit. Although the report does not contain details, it does recognize that available commercial cleaners could be modified, using available commercial components, to meet military needs.

The 1978 requirements justification document states that (1) a cleaning unit is needed for safe, efficient on-site cleaning of equipment; (2) the unit should be a general purpose, wheel-mounted steam cleaner; and (3) known off-the-shelf commercial equipment would not meet military requirements without the addition of other commercially available components. This document presented no new analysis or support for the statements made. It primarily referenced the 1976 study.

Based on the 1976 study and the 1978 requirements document, the Army designed a military standard cleaner. We found no evidence that the Army, during the lengthy period the standard cleaner was under consideration or development (1976-86), reevaluated the capability of commercial units or performed an economic analysis of available alternatives. This was not done even though the cost of the military designed

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standard cleaner with generator and trailer is about eight times greater than what the Army recently paid for commercial cleaners.

An Army official told us that no analysis was performed to determine specifically which units need a mobile steam cleaner. Rather, the Army has decided to furnish the cleaner to all units that currently use steam cleaners. Some Army officials believed, however, that it would be difficult to justify providing the cleaner to installations where power sources are available and equipment cleaning in the field is not a key requirement.

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## Army Has Not Developed Doctrine for Use of the Standard Steam Cleaner

Although the Army believes the standard steam cleaner provides much greater mobility and capability than the commercial cleaners currently being used, it has not developed specific doctrine on how these features will be used to enhance equipment cleaning in the field. Program officials at the U.S. Army Ordnance Center and School in Aberdeen, Maryland, told us that the doctrine on steam cleaners has not changed. The Army has always required that equipment be cleaned in the field, and equipment cleaning in the field is now done manually. The use of steam cleaners to remove grease and oil from equipment in the field is restricted during peacetime because of environmental considerations but will be permitted during war time.

According to a program official, general doctrine relating to the use of the cleaner is contained in

- existing equipment technical manuals that describe the need for cleaning equipment,
- a technical manual on the standard steam cleaner, and
- mission statements of user organizations that specify their need for mobility and therefore justify procuring mobile steam cleaning equipment.

Army officials could provide no documentation concerning such issues as how near the battle area the standard steam cleaners would be deployed, how the cleaners would be towed, and under what conditions the noisy automatic deposit removal feature would preclude use of the cleaner in combat areas. In fact, Army officials told us that, even in a war environment, the cleaners would be used only in established maintenance areas and that it was never anticipated that the cleaners would be based in remote areas independent of other maintenance support functions.

## Army Has Not Completed Testing the Standard Steam Cleaner

The Army awarded a contract for 325 standard steam cleaners in September 1987 before completing the necessary testing to verify that the steam cleaner will perform as required. The Army concluded the 500-hour test in mid-August 1988 and is currently assessing the results.

As originally designed by the development contractor, the standard steam cleaner included a cleaning unit with a 5-kilowatt generator mounted on a commercial trailer. In 1984, prototypes built to this design were tested for more than 3,000 hours. Based on those tests, the Army changed the cleaning unit and specified a 3-kilowatt generator mounted on a standard military trailer. Prototypes built to these specifications were tested, and additional design changes were made.

In February 1987, an Army review committee recommended that the standard steam cleaner be subjected to a 500-hour reliability test prior to first production to demonstrate that the design changes provided acceptable life and performance. However, the Army awarded the initial production contract in September 1987 before completing the required testing. According to the test project engineer, the testing was completed on August 12, 1988, and the results are being compiled for evaluation.

Army program officials said that the decision to award a contract before the redesigned cleaner was completely tested involved little risk. They do not expect the test evaluation to result in substantial design changes. They also said that to allow for any changes that might have to be made to the technical data package, the test would be fully evaluated before they start testing the contractor's first production.

## The Army Is Buying More Generators Than Needed for the Standard Steam Cleaner Program

The Army is buying 1,829 electric generators on the basis of the standard steam cleaner program, even though it plans to buy only 495 standard steam cleaners and trailers through fiscal year 1994. Therefore, the Army is buying 1,334 more generators than it currently needs. At a unit price of \$5,273, including a noise suppression kit, the 1,334 generators will cost \$7,034,182. The generators are scheduled for delivery through fiscal year 1994. Army officials told us, however, that the generators can be used for other requirements.

## Conclusions

The Army's decision to buy the standard steam cleaner is premature. The Army has not clearly demonstrated the need for a costly, newly designed cleaning unit in lieu of available commercial cleaners, has not

developed specific doctrine for its use, and has not assessed the results of recently completed reliability testing. Because the Army can continue to satisfy its minimum needs with commercial cleaners, there is no pressing need to proceed with production of the standard steam cleaner until the Army resolves the questions we identified concerning need, doctrine, and testing. In addition, the Army could incur unnecessary costs by buying more generators than it needs for the standard steam cleaners.

## Recommendations

We recommend that the Secretary of the Army defer buying the standard steam cleaners until

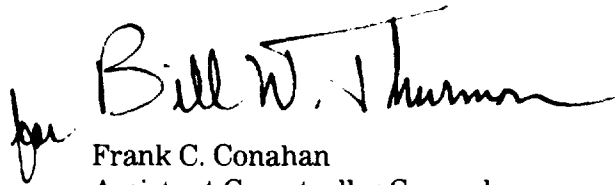
- the need for a cleaner with a dedicated power source and trailer is validated,
- doctrine is prepared describing how the cleaner will be used, and
- required reliability tests are evaluated and the technical data package is modified as needed.

If additional analysis does not support the need for the standard steam cleaners, consideration should be given to terminating the existing contract for the initial 325 units.

In addition, we recommend that the Secretary of the Army reduce the number of 3-kilowatt generators being procured to match the number of steam cleaners planned for procurement through fiscal year 1994.

As arranged with your Office, we are sending copies of this report to interested congressional committees, other Members of Congress, and the Secretaries of Defense and the Army. Copies will be made available to other parties upon request.

Sincerely yours,

  
Frank C. Conahan  
Assistant Comptroller General

# Objectives, Scope, and Methodology

We analyzed the Army's decision to develop and buy trailer-mounted steam cleaners to determine whether the Army needs the cleaner for all or part of its needs, whether the standard steam cleaner's capabilities exceed Army needs, and whether the Army has sufficiently tested the cleaner to support its procurement decision.

We performed our work primarily at the U.S. Army Armament, Munitions, and Chemical Command (AMCCOM) in Rock Island, Illinois, and at the U.S. Army Ordnance Center and School in Aberdeen, Maryland. AMCCOM, as the materiel developer, has been responsible for developing, testing, evaluating, buying, and distributing the trailer-mounted steam cleaner. The U.S. Army Ordnance Center and School is the designated proponent for the steam cleaner within the U.S. Army Training and Doctrine Command (TRADOC), which is the combat developer for the item. The combat developer is responsible for developing doctrinal and materiel requirements for the cleaner.

We interviewed program officials and reviewed supporting documentation to obtain information on the following:

- the Army's need and justification for a standard steam cleaner,
- the development of the cleaner,
- the extent and status of testing done to support the procurement decision,
- the Army's requirements for the cleaner,
- the Army's plans for funding the cleaner, and
- the status of procurement actions on the cleaner and associated components.

Also, we contacted officials at several Army installations to discuss their needs for steam cleaning equipment and their experience with the commercial steam cleaners that AMCCOM has been buying.

We performed our work from August 1987 through June 1988 in accordance with generally accepted government auditing standards. As requested, we did not obtain official comments on this report.

We did, however, discuss a draft of the report with Army officials responsible for the standard steam cleaner program and have incorporated their views where appropriate.







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