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Report to Congressional Committees

September 2003

CHEMICAL WEAPONS

Sustained Leadership, Along with Key Strategic Management Tools, Is Needed to Guide DOD's Destruction Program

GAO-03-1031

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Highlights

Highlights of GAO-03-1031, a report to congressional committees

Why GAO Did This Study

Congress expressed concerns about the Chemical Demilitarization Program cost and schedule, and its management structure. In 2001, the program underwent a major reorganization. Following a decade long trend of missed schedule milestones, in September 2001, the Department of Defense (DOD) revised the schedule, which extended planned milestones and increased program cost estimates beyond the 1998 estimate of $15 billion to $24 billion. GAO was asked to (1) examine the effect that recent organization changes have had on program performance and (2) assess the progress DOD and the Army have made in meeting the revised 2001 cost and schedule and Chemical Weapons Convention (CWC) deadlines.

What GAO Recommends

GAO recommends that DOD develop an overall strategy for the Chemical Demilitarization Program that would articulate the program's mission, identify the long-term goals and objectives, delineate the roles and responsibilities of all DOD and Army offices, and establish near-term performance measures. Also, DOD should implement a risk management approach that anticipates and influences internal and external factors that could adversely impact program performance.

DOD concurred with GAO's recommendations and said it is taking steps to implement them.

www.gao.gov/cgi-bin/getrpt?GAO-03-1031.

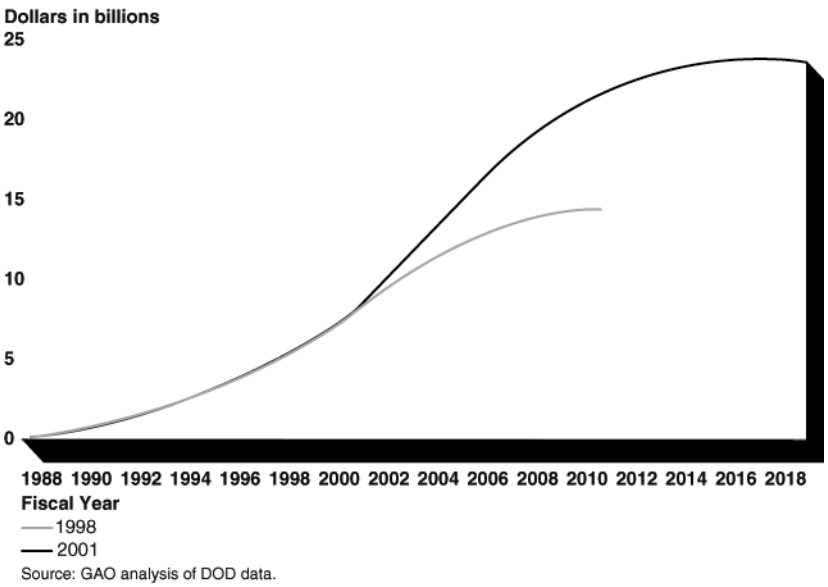
To view the full product, including the scope and methodology, click on the link above. For more information, contact Ray Decker at (202) 512-6020.

What GAO Found

The Chemical Demilitarization Program remains in turmoil because a number of long-standing leadership, organizational, and strategic planning issues remain unresolved. The program lacks stable leadership at the upper management levels. For example, the program has had frequent turnover in the leadership providing oversight. Further, recent reorganizations have done little to reduce the complex and fragmented organization of the program. As a result, roles and responsibilities are often unclear and program actions are not always coordinated. Finally, the absence of a comprehensive strategy leaves the program without a clear road map and methods to monitor program performance. Without these key elements, DOD and the Army have no assurance of meeting their goal to destroy the chemical stockpile in a safe and timely manner, and within cost estimates.

DOD and the Army have already missed several 2001 milestones and exceeded cost estimates; the Army has raised the program cost estimates by $1.2 billion, with other factors still to be considered. Almost all of the incineration sites will miss the 2001 milestones because of schedule delays due to environmental, safety, community relations, and funding issues. Although neutralization sites have not missed milestones, they have had delays. DOD and the Army have not developed an approach to anticipate and influence issues that could adversely impact program schedules, cost, and safety. Unless DOD and the Army adopt a risk management approach, the program remains at great risk of missing milestones and CWC deadlines. It will also likely incur rising costs and prolong the public's exposure to the chemical stockpile.

Comparison of 1998 and 2001 Cumulative Program Cost Estimates



Source: GAO analysis of DOD data.

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Abbreviations

ACWA	Assembled Chemical Weapons Assessment
CMA	Chemical Materials Agency
CSEPP	Chemical Stockpile Emergency Preparedness Program
CWC	Chemical Weapons Convention
DOD	Department of Defense
FEMA	Federal Emergency Management Agency

GAO
Accountability * Integrity * Reliability

United States General Accounting Office
Washington, DC 20548

September 5, 2003

The Honorable John Warner
Chairman
The Honorable Carl Levin
Ranking Minority Member
Committee on Armed Services
United States Senate

The Honorable Duncan Hunter
Chairman
The Honorable Ike Skelton
Ranking Minority Member
Committee on Armed Services
House of Representatives

The United States, along with many other countries, is committed to ridding the world of chemical weapons. In fiscal year 1986, Congress directed the Department of Defense (DOD) to destroy the nation's chemical weapons stockpile in a safe manner, and DOD designated the Army to set up and operate the demilitarization program. On an international level, the United States and more than 150 countries since 1997 have become parties to the Chemical Weapons Convention (CWC), which prohibits the use of these weapons and mandates a deadline of April 2007 to destroy the existing stockpiles.[1] With the events of September 11, 2001, heightened concerns over weapons of mass destruction have further raised the awareness of these chemical weapons and their potential danger to the public.

Since its inception, DOD's Chemical Demilitarization Program has been plagued by frequent schedule delays, cost overruns, and continuing management problems. In 2001, DOD and the Army[2] once again undertook

[1] In April 1997, the United States Senate ratified the Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction, commonly known as the Chemical Weapons Convention. S. Res. 75, Apr. 24, 1997.

[2] DOD reorganized the program by elevating its oversight while the Army consolidated functions at the Assistant Secretary level (Installations and Environment).

a major reorganization of the program's complex management structure and revised its schedule, extending the projected milestones beyond the 2007 CWC deadline. The revisions also increased the estimated costs for destroying the chemical weapons stockpile by 60 percent, from $15 billion to $24 billion. Because DOD and the Army have had long-term problems in meeting past schedule milestones and are now entering a demanding phase of the program—the planned start of agent destruction operations at multiple sites, using both incineration and alternative (neutralization) technologies—there are growing concerns in Congress over DOD's ability to accomplish its mission.

In the House Report to the fiscal year 2003 defense authorization budget,[3] Congress mandated that we review and assess the management and status of the program. In February 2003, we briefed your staffs on our preliminary findings. As agreed with your offices, this report (1) examines the effect that recent organizational changes have had on the program's performance and (2) assesses the progress that DOD and the Army have made in meeting the revised 2001 cost and schedule estimates and the 2007 CWC deadline.

Leading organizations embrace principles for effectively implementing and managing programs. Some key aspects of these principles include promulgating a comprehensive mission statement, long-term and annual performance goals, measurable performance indicators, and evaluation and corrective action plans. Combined with effective leadership, these principles provide decision makers with a means to manage risk, understand a program's evolution and implementation, and determine whether initiatives are achieving their desired results.

In assessing the program's management performance, we compared the elements of program management documents to the general tenets and management principles, such as those supported by the Government Performance and Results Act, to determine if the program has a framework to produce results. We also compared previous and current program organizational structures and obtained a rationale for changes from program officials and documents to determine if lines of authority were clear and if roles and responsibilities were articulated. To assess

[3] Bob Stump National Defense Authorization Act for Fiscal Year 2003, Report of the Committee on Armed Services, House of Representatives, H.R. Rept. No. 107-436, May 3, 2002.

DOD's progress in meeting revised schedule and cost estimates, we reviewed current program estimates, destruction schedules, CWC provisions, and other documents. We determined issues that had caused delays and ascertained approaches being used to reduce the potential for delays in the future. We also met with DOD and Army program officials and interviewed officials at several destruction sites and state environmental offices. We conducted our review from August 2002 to June 2003 in accordance with generally accepted government auditing standards. A detailed description of our scope and methodology is included in appendix I.

Results in Brief

While DOD and the Army have recently initiated some organizational changes in the Chemical Demilitarization Program, the program remains in turmoil, affecting management performance because of long-standing and unresolved leadership, organizational, and strategic planning issues. The lack of sustained leadership at both the upper levels of oversight and at the program-manager level confuses the decision-making authority and obscures accountability.[4] Moreover, the recent reorganization has done little to reduce the program's complex management structure. It continues to have multiple lines of management authority within the Army and separation of program components between the Army and DOD. These separations leave roles and responsibilities for the different parts of the program unclear. Finally, the absence of an overarching, comprehensive strategy has left the program without a clear, top-level road map to closely guide and integrate all activities and to monitor program performance. Without key elements such as effective leadership, streamlined organization structure, and important management tools including strategic planning, DOD and the Army have no assurances that they will be able to meet the program's principal goal—to destroy the chemical stockpile in a safe manner and by the Chemical Weapons Convention 2007 deadline.

The program has missed most schedule milestones and cost estimates following a decade long trend. Nearly all of the incineration sites will miss the DOD-approved 2001 schedule milestones because of substantial delays that stem primarily from a number of problems that DOD and the Army have not been able to anticipate or influence. These problems include

[4] For purposes of this report, upper level refers to the offices of the assistant secretary or above in the Departments of the Army and Defense.

plant safety issues, difficulties in meeting environmental permitting requirements, public concerns about emergency preparedness plans, and budgeting shortfalls. Although the neutralization sites have not missed their milestones yet, they too have experienced delays. Program officials told us that they have already raised preliminary total program cost estimates by $1.2 billion, and other factors, yet to be considered, could raise these estimates even more. DOD and the Army have not developed an approach to anticipate and address potential problems that could adversely affect program schedules, costs, and safety. Until DOD and the Army adopt a comprehensive risk management approach, the program remains at great risk of not meeting its schedule milestones and the Chemical Weapons Convention deadline, leading to rising costs and unnecessarily prolonging the potential risk to the public associated with the storage of the chemical stockpile.

We are recommending that DOD develop an overall strategy for the Chemical Demilitarization Program that would articulate the program's mission, identify the long-term goals and objectives, delineate the roles and responsibilities of all DOD and Army offices, and establish near-term performance measures. Also, DOD should implement a risk management approach that anticipates and influences internal and external factors that could adversely impact program performance.

In written comments on a draft of this report, DOD concurred with our recommendations and said it is taking steps to implement them.

Background

In fiscal year 1986, Congress directed DOD to destroy the U.S. stockpile of lethal chemical agents and munitions.[5] DOD designated the Department of the Army as its executive agent for the program, and the Army established the Chemical Demilitarization (or Chem-Demil) Program, which was charged with the destruction of the stockpile at nine storage sites. Incineration was selected as the method to destroy the stockpile.[6] In 1988, the Chemical Stockpile Emergency Preparedness Program (CSEPP) was created to enhance the emergency management and response capabilities of communities near the storage sites in case of an accident; the Army and

[5] The Department of Defense Authorization Act for Fiscal Year 1986, P.L. 99-145 (Nov. 8, 1985), sec. 1412(a).

[6] The Program Manager for Chemical Demilitarization was originally referred to as the U.S. Army Chemical Demilitarization and Remediation Activity.

the Federal Emergency Management Agency (FEMA) jointly managed the program. In 1997, consistent with congressional direction, the Army and FEMA clarified their CSEPP roles by implementing a management structure under which FEMA assumed responsibility for off-post (civilian community) program activities, while the Army continued to manage on-post chemical emergency preparedness. The Army provides CSEPP funding to FEMA, which is administered via grants to the states and counties near where stockpile sites are located in order to carry out the program's off-post activities.

Agent destruction began in 1990 at Johnston Atoll in the Pacific Ocean. Subsequently, Congress directed DOD to evaluate the possibility of using alternative technologies to incineration. In 1994, the Army initiated a project to develop nonincineration technologies for use at the two bulk-agent only sites at Aberdeen, Maryland, and Newport, Indiana. These sites were selected in part because their stockpiles were relatively simple—each site had only one type of agent and this agent was stored in bulk-agent (ton) containers. In 1997, DOD approved pilot testing of a neutralization technology at these two sites. Also in 1997, Congress directed DOD to evaluate the use of alternative technologies and suspended incineration planning activities at two sites with assembled weapons in Pueblo, Colorado, and Blue Grass, Kentucky. Furthermore, Congress directed that these two sites be managed in a program independent of the Army's Chem-Demil Program and report to DOD instead of the Army. Thus, the Assembled Chemical Weapons Assessment (ACWA) program was established. The nine sites, the types of agent, and the percentage of the original stockpiles are shown in table 1.

Table 1: Stockpile Sites, Type of Agent, Original Agent Tonnage, and Percentage of Original Stockpile

Site	Type of agent[a]	Original agent tonnage	Percent of original stockpile
Johnston Atoll	Blister and nerve	2,031	6
Tooele, Utah	Blister and nerve	13,616	44
Anniston, Ala.	Blister and nerve	2,254	7
Umatilla, Oreg.	Blister and nerve	3,717	12
Pine Bluff, Ark.	Blister and nerve	3,850	12
Aberdeen, Md.	Blister	1,625	5
Newport, Ind.	Nerve	1,269	4
Pueblo, Colo.	Blister	2,611	8
Blue Grass, Ky.	Blister and nerve	523	2
Total		**31,496**	**100**

Source: DOD data.

[a]The stockpile includes two nerve agents, GB and VX, and blister agents.

In 1997, the United States ratified the CWC, which prohibits the use of these weapons and mandates the elimination of existing stockpiles by April 29, 2007.[7] A CWC provision allows that extensions of up to 5 years can be granted. The CWC also contains a series of interim deadlines applicable to the U.S. stockpile[8] (see table 2).

Table 2: CWC Deadlines

Required percentage of agent destroyed	Deadlines for destruction	Date United States met deadline
1	April 29, 2000	September 1997
20	April 29, 2002	July 2001
45	April 29, 2004	NA
100	April 29, 2007	NA

Sources: CWC and U.S. Army.

Legend: NA - Not applicable.

[7] The CWC implementing legislation, P.L. 105-277 (Oct. 21, 1998), provides the statutory authority for domestic compliance with the convention's provisions.

[8] This report solely focuses on the weapons the convention defines as category 1, which are the most dangerous chemicals in the stockpile.

The United States met the 1 percent interim deadline in September 1997 and the 20 percent interim deadline in July 2001. As of June 2003, the Army was reporting that a total of about 26 percent of the original stockpile had been destroyed.[9]

Three other countries (referred to as states parties)—India, Russia, and one other country—have declared chemical weapons stockpiles and are required to destroy them in accordance with CWC deadlines as well. As of April 2003, two of these three countries (India and one other country) had met the 1 percent interim deadline to destroy their stockpiles.[10] Of the three countries, only India met the second (20 percent) interim deadline to destroy its stockpile by April 2002. However, Russia, with the largest declared stockpile—over 40,000 tons— did not meet the 1 percent or the 20 percent interim deadlines, and only began destroying its stockpile in December 2002. In 2001, Russia requested a 5-year extension to the 2007 deadline.[11] Russia did destroy 1 percent of its stockpile by April 2003, although it is doubtful that it will meet the 2012 deadline if granted.[12]

Traditionally, management and oversight responsibilities for the Chem-Demil Program reside primarily within three levels at DOD—the Under Secretary of Defense (Acquisition, Technology, and Logistics) who is the Defense Acquisition Executive for the Secretary of Defense, the Assistant Secretary of the Army (Acquisition, Logistics, Technology) who is the Army Acquisition Executive for the Army, and the Program Manager for Chemical Demilitarization—because it is a major defense acquisition program.[13] In addition to these offices, since August 2002, the Deputy Assistant to the Secretary of Defense (Chemical Demilitarization and Threat Reduction), has served as the focal point responsible for oversight, coordination, and integration of the Chem-Demil Program.

[9] As of June 2003, agent had been destroyed at Johnston Atoll, Tooele, and Aberdeen.

[10] One other state party is not included in this assessment because it is expected to submit a detailed declaration of the chemical weapons stockpile that was recently discovered on its territory.

[11] The CWC's implementing body, the Organization for the Prohibition of Chemical Weapons, is in the process of negotiating future Russian destruction deadlines.

[12] U.S. General Accounting Office, *Weapons of Mass Destruction: Additional Russian Cooperation Needed to Facilitate U.S. Efforts to Improve Security of Russian Sites*, GAO-03-482 (Washington, D.C.: Mar. 24, 2003).

[13] DOD Directive 5000.1, the *Defense Acquisition System*, May 12, 2003, and DOD Instruction 5002.2, *Operations of the Defense Acquisition System*, May 12, 2003.

In May 2001, in response to program cost, schedule, and management concerns, milestone decision authority was elevated to the Under Secretary of Defense (Acquisition, Technology, and Logistics). DOD stated that this change would streamline future decision making and increase program oversight. DOD indicated that the change was also consistent with the size and scope of the program, international treaty obligations, and the level of local, state, and federal interest in the safe and timely destruction of the chemical stockpile.

In September 2001, after more than a yearlong review, DOD revised the program's schedule milestones for seven of the nine sites and the cost estimates for all nine sites.[14] These milestones represent the target dates that each site is supposed to meet for the completion of critical phases of the project. The phases include design, construction, systemization, operations, and closure. (Appendix II describes these phases and provides the status of each site.) The 2001 revision marked the third time the program extended its schedule milestones and cost estimates since it became a major defense acquisition program in 1994. The 2001 revision also pushed the milestones for most sites several years beyond the previous 1998 schedule milestones and, for the first time, beyond the April 2007 deadline contained in the CWC. Table 3 compares the 1998 and 2001 schedule milestones for starting and finishing agent destruction operations at the eight sites with chemical agent stockpiles in 2001.[15] The planned agent destruction completion date at some sites was extended over 5 years.

[14] The cost estimates for the Pueblo and Blue Grass sites were based on incineration technology pending a technology decision.

[15] Johnston Atoll is not included because its stockpile has been destroyed.

Table 3: Comparison of DOD's 1998 and 2001 Milestones for Starting and Finishing Agent Destruction Operations

	Planned agent destruction start date[a]			Planned agent destruction completion date		
Site	1998	2001	Change (no. of months)	1998	2001	Change (no. of months)
Tooele	Ongoing	Ongoing[b]	NA	Oct. 2003	Feb. 2008	+ 53
Anniston	Jan. 2002	July 2002	+ 7	Nov. 2005	May 2011	+ 67
Umatilla	Feb. 2002	July 2003	+ 18	June 2005	Jan. 2011	+ 68
Pine Bluff	June 2002	Oct. 2003	+ 17	Oct. 2005	Nov. 2009	+ 50
Aberdeen	Jan. 2004	Mar. 2005	+ 15	Dec. 2004	Mar. 2008	+ 40
Newport	Jan. 2004	Dec. 2006	+ 36	Dec. 2004	Nov. 2009	+ 60
Blue Grass	NA[c]					
Pueblo	NA[c]					

Sources: DOD and U.S. Army.

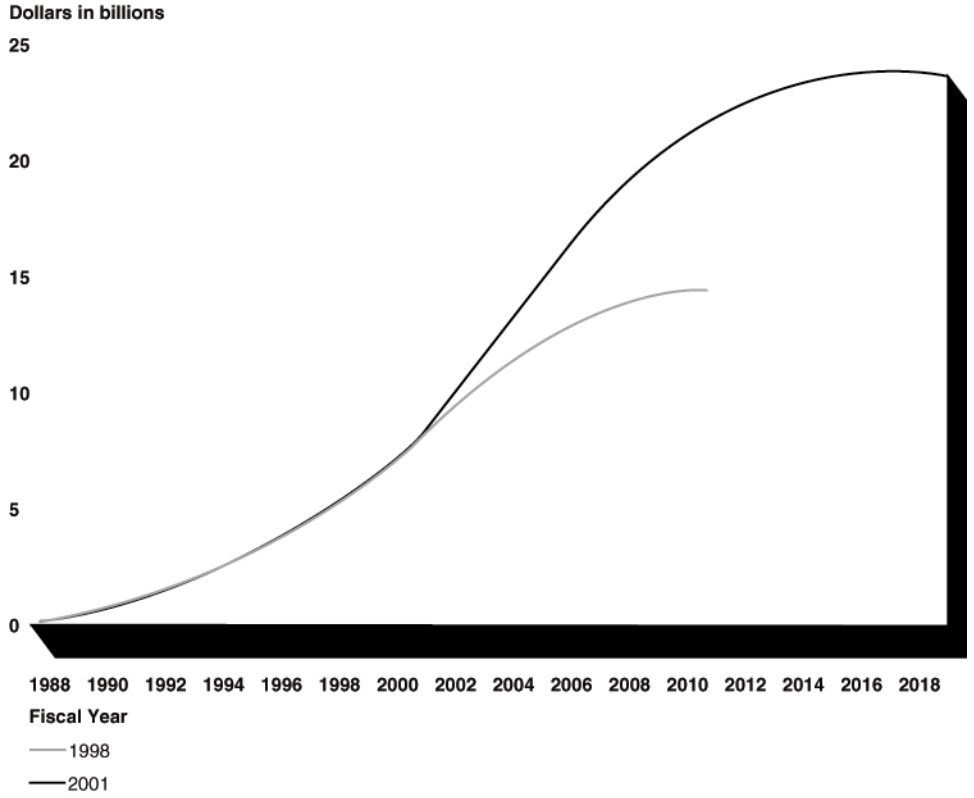
[a]The 2001 schedule milestones reflect both Army and DOD changes.

[b]Tooele was already conducting destruction operations when the 1998 and 2001 estimates for this phase were made.

[c]NA - Not available. Schedules are to be determined after technology decisions for Blue Grass and Pueblo are made.

DOD extended the schedule milestones to reflect the Army's experience at the two sites—Johnston Atoll and Tooele—that had begun the destruction process prior to 2001. It found that previous schedule milestones had been largely based on overly optimistic engineering estimates. Lower destruction rates stipulated by environmental regulators, and increased time needed to change the facility's configuration when switching between different types of chemical agents and weapons, meant destruction estimates needed to be lengthened. Moreover, experience at Johnston Atoll, which began closure activities in 2000, revealed that previous closure estimates for other sites had been understated. In addition, DOD's Cost Analysis Improvement Group modified the site schedules based on a modeling technique that considered the probabilities of certain schedule activities taking longer than anticipated. In particular, the group determined that the operations phase, where agent destruction takes place, has the highest probability for schedule delays and lengthened that phase the most. Because the costs of the program are directly related to the length of the schedule, DOD also increased the projected life-cycle costs, from $15 billion in 1998 to $24 billion in 2001 (see fig. 1).

Figure 1: Comparison of 1998 and 2001 Cumulative Program Cost Estimates



Source: GAO analysis of DOD data.

In December 2001, after the program schedule and costs were revised, the Army transferred primary program oversight from the Office of the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) to the Office of the Assistant Secretary of the Army (Installations and Environment). According to the Army, this move streamlined responsibilities for the program, which were previously divided between these two offices. In January 2003, the Army reassigned oversight responsibilities to the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) for all policy and direction for the Chem-Demil Program and CSEPP. The Secretary of the Army also directed the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) and the Commanding General, U.S. Army Materiel Command, to jointly establish an agency to perform the chemical demilitarization as well as the chemical weapons storage functions. In response to this directive, the Army announced the creation of a new organization—the Chemical

Materials Agency (CMA)—which will merge the demilitarization and the storage functions.[16] During this transition process, the Program Manager for Chemical Demilitarization was redesignated as the Program Manager for the Elimination of Chemical Weapons and will report to the Director of CMA and have responsibility for each site through the systemization phase. The Director for Operations will manage the operations and closure phases. As of June 2003, the Program Manager for the Elimination of Chemical Weapons was providing day-to-day management for the sites at Anniston, Umatilla, Newport, and Pine Bluff; the Director for Operations was providing day-to-day management for the sites at Tooele, Aberdeen, and Johnston Atoll, and the Program Manager, ACWA, was managing the sites at Pueblo and Blue Grass.

Since 1990, we have issued a number of reports that have focused on management, cost, and schedule issues related to the Chem-Demil Program. For example, in a 1995 testimony we cited the possibility of further cost growth and schedule slippage due to environmental requirements, public opposition to the baseline incineration process, and lower than expected disposal rates. We also testified that weaknesses in financial management and internal control systems have hampered program results and alternative technologies were unlikely to mature enough to meet CWC deadlines.

In 1995, we noted that the emergency preparedness program had been slow to achieve results and that communities were not fully prepared to respond to a chemical emergency. In 1997, we found high-level management attention was needed at the Army and FEMA to clearly define management roles and responsibilities. In 2001, we found that the Army and FEMA needed a more proactive approach to improve working relations with CSEPP states and local communities and to assist them in preparing budgets and complying with program performance measures.

In 2000, we found that the Chem-Demil Program was hindered by its complex management structure and ineffective coordination between program offices. We recommended that the Secretary of Defense direct the Secretary of the Army to clarify the management roles and responsibilities of program participants, assign accountability for achieving program goals and results, and establish procedures to improve

[16] According to Army officials, CMA is provisional, but the Army expects to have this agency fully established by October 2003.

coordination among the program's various elements and with state and local officials.

A detailed list of these reports and other products is included in Related GAO Products at the end of this report.

Long-Standing Management and Organization Weaknesses Continue to Hamper Program Progress

Despite recent efforts to improve the management and streamline the organization of the Chem-Demil Program, the program continues to falter because several long-standing leadership, organizational, and strategic planning weaknesses remain unresolved. The absence of sustained leadership confuses decision-making authority and obscures accountability. In addition, the Army's recent reorganization of the program has not reduced its complex organization nor clarified the roles and responsibilities of various entities. For example, CMA reports to two different offices with responsibilities for different phases of the program and left the management of CSEPP divided between the Army and FEMA. The ACWA program continues to be managed outside of the Army as directed by Congress. Finally, the lack of an overarching, comprehensive strategy has left the Chem-Demil Program without a top-level road map to guide and monitor the program's activities. The absence of effective leadership, streamlined organization, and important management tools, such as strategic planning, creates a barrier to the program accomplishing the safe destruction of the chemical stockpile and staying within schedule milestones, thereby raising program costs.

Shifts in Leadership Confuse Decision-Making Authority and Obscure Accountability

The Chem-Demil Program has experienced frequent shifts in leadership providing oversight, both between DOD and the Army and within the Army, and frequent turnover in key program positions. These shifts have led to confusion among participants and stakeholders about the program's decision making and have obscured accountability. For example, program officials were not consistent in following through on promised initiatives and some initiatives were begun but not completed. Also, when leadership responsibilities changed, new initiatives were often introduced and old initiatives were abandoned, obscuring accountability for program actions.

Changes in Oversight Responsibilities Confuse Decision-Making Role

The program has lacked sustained leadership above the program level as demonstrated by the multiple shifts between DOD and the Army for providing oversight that affects consistent decision making. The leadership responsible for oversight has shifted between the Army and DOD three times during the past two decades, with the most recent change occurring in 2001. Table 4 summarizes these changes. As different

offices took over major decision authority, program emphasis frequently shifted, leaving initiatives pursued but not completed, consistency of initiatives was not maintained, and responsibility for decisions shifted. For example, we reported in August 2001 that the Army and FEMA had addressed some management problems in how they coordinated emergency preparedness activities after they had established a memorandum of understanding to clarify roles and responsibilities related to CSEPP.[17] However, according to FEMA officials, DOD did not follow the protocols for coordination as agreed upon with the Army when making decisions about emergency preparedness late in 2001. This led to emergency preparedness items being funded without adequate plans for distribution, which delayed the process. These changes in oversight responsibilities also left the stakeholders in the states and local communities uncertain as to the credibility of federal officials.

Table 4: Transfer of Program Oversight Responsibilities between DOD and the Army, 1986-Present

Year	Oversight authority	Action
1986	Army	DOD designates the Army as the executive agent for the Chem-Demil Program.
1994	DOD	DOD makes the program a major defense acquisition program and oversight is elevated to control cost and schedule increases and to raise program visibility.
1998	Army	DOD delegates decision-making authority to the Army, primarily as part of its overall effort to reduce responsibilities and staffing of its offices.
2001	DOD	DOD reinstates its position as the program's top decision maker. According to DOD, this was done to streamline decision making, which is consistent with the cost of the program and national and state interest in the safe and timely destruction of the stockpile.

Source: GAO analysis of DOD data.

[17] U.S. General Accounting Office, *Chemical Weapons: FEMA and Army Must Be Proactive in Preparing States for Emergencies* GAO-01-850 (Washington, D.C.: Aug. 13, 2001).

Leadership responsibilities for the program within the Army have also transferred three times from one assistant secretary to another (see table 5). During this time, there were numerous CSEPP issues that the Army took positions on with which FEMA did not concur. For example, in August 2002, the Assistant Secretary of the Army (Installations and Environment) officials committed to funding nearly $1 million to study building an emergency operations center for a community near Umatilla with additional funds to be provided later. Since the program shifted to the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) in 2003, program officials have been reconsidering this commitment. The problem of Army and FEMA not speaking with one voice led to confusion among state and local communities. Further, dual or overlapping authority by the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) and the Assistant Secretary of the Army (Installations and Environment) in 2001 was not clarified. Without clear lines of authority, one office took initiatives without consulting the other. As a result, stakeholders were unclear if initiatives were valid.

In addition to these program shifts, the Deputy Assistant Secretary of the Army (Chemical Demilitarization)—an oversight office moved from DOD to the Army in 1998—reported to the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) from 1998 until 2001, then to the Assistant Secretary of the Army (Installations and Environment) until 2003, and now again to the Assistant Secretary of the Army (Acquisition, Logistics, and Technology). These many shifts in this oversight office with responsibility for programmatic decisions left stakeholders confused about this office's oversight role and about the necessity of funding requests it made. As a result, the accumulation of extra funding ultimately caused Congress to cut the program's budget.[18]

[18] U.S. General Accounting Office, *Chemical Weapons Disposal: Improvements Needed in Program Accountability and Financial Management*, GAO/NSIAD-00-80 (Washington, D.C.: May 8, 2000).

Table 5: Transfer of Program Oversight Responsibilities within the Army, 1986-Present

Year	Army organization	Action
1986	Assistant Secretary of the Army (Installations and Environment)	The Secretary of the Army assigned oversight of the Chem-Demil Program to the Assistant Secretary of the Army (Installations and Environment).
1994	Assistant Secretary of the Army (Research, Development, and Acquisition)	When DOD designated the program a major defense acquisition program, the Army transferred oversight to the Assistant Secretary of the Army (Research, Development, and Acquisition).
2001	Assistant Secretary of the Army (Installations and Environment)	To streamline the program's organizational structure, the Army transferred oversight back to the Assistant Secretary of the Army (Installations and Environment).
2003	Assistant Secretary of the Army (Acquisition, Logistics, and Technology)	The Army transfers the program back to the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) when CMA was established.

Source: GAO analysis of U.S. Army data.

Frequent Changes in Key Program Officials Obscure Accountability

The Chem-Demil Program has experienced a number of changes and vacancies in key program leadership positions, which has obscured accountability. This issue is further compounded, as discussed later, by the lack of a strategic plan to provide an agreed upon road map for officials to follow. Within the Army, three different officials have held senior leadership positions since December 2001. In addition, five officials have served as the Deputy Assistant Secretary of the Army (Chem-Demil) during that time.[19] The program manager's position remained vacant for nearly 1 year, from April 2002 to February 2003, before being filled. However, in June, after only 4 months, the program manager resigned and the Army named a replacement.

Frequent shifts in key leadership positions led to several instances where this lack of continuity affected decision making and obscured accountability. For example, in June 2002, a program official promised to support future funding requests for emergency preparedness equipment

[19] This position is now the Deputy Assistant Secretary of the Army (Elimination of Chemical Weapons).

from a community, but his successor did not fulfill this promise. This promise caused communities to submit several funding requests that were not supported. The lack of leadership continuity makes it unclear who is accountable when commitments are made but not implemented. Moreover, when key leaders do not remain in their positions long enough to develop the needed long-term perspective (on program issues) or to effectively follow through on program initiatives, it is easy for them to deny responsibility for previous decisions and avoid current accountability.

Recent Reorganization Has Not Reduced Organizational Complexity

The recent reorganization by the Army has not streamlined the program's complex organization or clarified roles and responsibilities. For example, the Director of CMA will now report to two different senior Army organizations, which is one more than under the previous structure. This divided reporting approach is still not fully developed, but it may adversely affect program coordination and accountability. The reorganization has also divided the responsibility for various program phases between two offices within CMA. One organization, the Program Manager for the Elimination of Chemical Weapons, will manage the first three phases for each site and a newly created organization, the Director of Operations, will manage the final two phases. This reorganization changes the cradle-to-grave management approach that was used to manage sites in the past and has blurred responsibities for officials who previously provided support in areas such as quality assurance and safety. Moreover, the reorganization did not address two program components—community-related CSEPP and ACWA. CSEPP will continue to be jointly managed with FEMA. ACWA, as congressionally directed, will continue to be managed separately from the Army by DOD.

During the transition process, no implementation plan was promulgated when the new organization was first announced in January 2003. As of June 2003, the migration of roles and responsibilities formerly assigned to the office of the Program Manager for Chemical Demilitarization into the new CMA had not been articulated. For example, several key CMA officials who had formerly been part of the former program office told us that they were unsure of their new roles within CMA and the status of ongoing program initiatives. Furthermore, past relationships and responsibilities among former program offices and site activities have been disrupted. Although the establishment of CMA with a new directorate responsible for operations at Tooele and Aberdeen is underway, former program office staff told us they did not know how this new organization would manage the sites in the future.

Program Lacks Strategy and Implementation Plan

While DOD and the Army have issued numerous policies and guidance documents for the Chem-Demil Program, they have not developed an overarching, comprehensive strategy or an implementation plan to guide the program and monitor its progress. Leading organizations embrace principles for effectively implementing and managing programs. Some key aspects of this approach include promulgating a comprehensive strategy to include mission, long-term goals, and methods to accomplish these goals and an implementation plan that includes annual performance goals, measurable performance indicators, and evaluation and corrective action plans. According to DOD and Army officials, the Chem-Demil Program relies primarily on guidance and planning documents related to the acquisition process.[20] For example, the former program manager drafted several documents, such as the Program Manager for Chemical Demilitarization's Management Plan and Acquisition Strategy for the Chemical Demilitarization Program, as the cornerstone of his management approach. Our review of these and other key documents showed that they did not encompass all components of the program or other nonacquisition activities. Some documents had various elements, such as a mission statement, but they were not consistently written. None contained all of the essential elements expected in a comprehensive strategy nor contained aspects needed for an implementation plan, such as an evaluation and corrective action plan. Further, all documents were out of date and did not reflect recent changes to the program.

DOD and Army officials stated that the program's strategy would be articulated in the updated program's acquisition strategy to be completed by the new Director of CMA. According to the draft acquisition strategy, the focus is to acquire services, systems, and equipment. Again, this approach does not address all components of the Chem-Demil Program, such as CSEPP and ACWA.

More importantly, a strategic plan would ensure that all actions support overall program goals as developed by the appropriate senior-level office with oversight responsibility for the program. An implementation plan would define the steps the program would take to accomplish its mission. Further, a strategy document, coupled with an implementation plan, would clarify roles and responsibilities and establish program performance measurements. Together, these documents would provide

[20] Acquisition programs establish program goals for cost, schedule, and performance parameters over the program's life cycle.

the foundation for a well-managed program to provide continuity of operations for program officials to follow.

Most Sites Will Miss Schedule Milestones due to Program's Inability to Anticipate and Influence Issues

The program continues to miss most milestones, following a decade long trend. Nearly all of the incineration sites will miss the 2001 scheduled milestones because of substantial delays during their systematization (equipment testing) or operations (agent destruction) phases. Delays at sites using incineration stem primarily from a number of problems that DOD and the Army have not been able to anticipate or control, such as concerns involving plant safety, difficulties in meeting environmental permitting requirements, public concerns about emergency preparedness plans, and budgeting shortfalls. The neutralization sites have not missed milestones yet but have experienced delays as well. DOD and the Army have not developed an approach to anticipate and address potential problems that could adversely affect program schedules, costs, and safety. Neither DOD nor the Army has adopted a comprehensive risk management approach to mitigate potential problems. As a result, the Chem-Demil Program will have a higher level of risk of missing its schedule milestones and CWC deadlines, incurring rising costs, and unnecessarily prolonging the potential risk to the public associated with the storage of the chemical stockpile.

Substantial Delays at Incineration Sites Led to Missed Milestones

Most incineration sites will miss important milestones established in 2001 due to schedule delays. For example, delays at Anniston, Umatilla, and Pine Bluff have already resulted, or will result, in their missing the 2001 schedule milestones to begin chemical agent destruction operations (operation phase). [21] Johnston Atoll will miss its schedule milestone for shutting down the facility (closure phase).[22] The Tooele site has not missed any milestones since the 2001 schedule was issued; however, the site has undergone substantial delays in destroying its stockpile primarily due to a safety-related incident in July 2002.[23] If additional delays occur at the

[21] At the time of the 2001 schedule revision, all three of these sites were in the systemization phase; thus, their next milestone was to begin agent destruction operations.

[22] At the time of the 2001 schedule revision, agent destruction operations had been completed and its next milestone was to complete closure of the facility.

[23] According to Army officials, the United States will not meet the 45 percent interim CWC deadline by April 2004.

Tooele site, it could also exceed its next milestone as well. Table 6 shows the status of the incineration sites that will miss 2001 schedule milestones.

Table 6: Slippage of 2001 Scheduled Milestone Dates, by Incineration Site

Site	Next project milestone	2001 schedule date to begin next milestone	Estimated[a] date to begin next phase	Difference between 2001 schedule and estimate (no. of months)
Anniston	Operations	July 2002	July 2003	+12
Umatilla	Operations	July 2003	Dec. 2003	+5
Pine Bluff	Operations	Oct. 2003	Apr. 2004	+6
Johnston Atoll	End of closure	Sept. 2003	Jan. 2004	+4

Sources: DOD and the U.S. Army.

[a]Program manager's official estimate for Pine Bluff and Johnston Atoll; unofficial estimates for other sites based on discussions with site officials as of June 2003.

The delays at the incineration sites have resulted from various long-standing issues, which the Army has not been able to effectively anticipate or control because it does not have a process to identify and mitigate them. An effectively managed program would have an approach, such as lessons learned, to identify and mitigate issues. Although the program now has extensive experience with destroying agents at two sites, the Chem-Demil Programmatic Lessons Learned Program has been shifted to individual contractors from a headquarters centralized effort. In September 2002, we reported on the effectiveness of the centralized lessons learned program and found it to be generally effective, but it should be improved and expanded.[24] By decentralizing the program, it is uncertain how knowledge will be leveraged between sites to avoid or lessen potential delays due to issues that have previously occurred. In addition, program officials told us that they were concerned that lessons from the closure at Johnston Atoll were not being captured and saved for future use at other sites.

Many delays have resulted from incidents during operations, environmental permitting, community protection, and funding issues. This continues to be a trend we identified in previous reports on the

[24] U.S General Accounting Office, *Chemical Weapons: Lessons Learned Program Generally Effective but Could Be Improved and Expanded*, GAO-02-890 (Washington, D.C.: Sept. 10, 2002).

program. The following examples illustrate some of the issues that have caused delays at incineration sites since 2001:

- Incidents during operations: Agent destruction operations at Tooele were suspended from July 2002 to March 2003 because of a chemical incident involving a plant worker who came into contact with a nerve agent while performing routine maintenance. Subsequent investigations determined that this event occurred because some procedures related to worker safety were either inadequate or not followed. A corrective action plan, which required the implementation of an improved safety plan, was instituted before operations resumed. Since it resumed operations in March 2003, Tooele has experienced several temporary shutdowns. (These shutdowns are discussed further in app. II.)

- Environmental permitting: The start of agent destruction operations at Umatilla and Anniston sites has been delayed because of several environmental permitting issues.[25] Delays at the Umatilla site have resulted from several unanticipated engineering changes related to reprogramming software and design changes that required permit modifications. An additional delay occurred at the Umatilla site when the facility was temporarily shut down in October 2002 by state regulators because furnaces were producing an unanticipated high amount of heavy metals during surrogate agent testing. The testing was suspended until a correction could be implemented. Delays at the Anniston site occurred because state environmental regulators did not accept test results for one of the furnaces because the subcontractor did not follow state permit-specified protocols.

- Community protection: Destruction operations at the Anniston site have been delayed because of concerns about emergency preparedness for the surrounding communities. These concerns included the inadequacy of protection plans for area schools and for special needs residents. Although we reported on this issue in July 1996[26] and again in August 2001 and a senior DOD official identified it as a key concern in September 2001, the

[25] We have reported on permitting delays in *Chemical Weapons And Materiel: Key Factors Affecting Disposal Costs and Schedule*, GAO/NSIAD-97-18 (Washington, D.C.: Feb. 10, 1997).

[26] See U.S. General Accounting Office, *Chemical Weapons Stockpile: Emergency Preparedness in Alabama Is Hampered by Management Weaknesses*,GAO/NSIAD-96-150 (Washington, D.C: July 23, 1996) and *Chemical Weapons: FEMA and Army Must Be Proactive in Preparing States for Emergencies*, GAO-01-850 (Washington, D.C.: Aug. 13, 2001).

Army was unable to come to a satisfactory resolution with key state stakeholders prior to the planned January 2003 start date. As of June 2003, negotiations were still ongoing between the Army and key public officials to determine when destruction operations could begin.

- Funding: Systemization and closure activities were delayed at Pine Bluff and Johnston Atoll sites, respectively, because program funds planned for demilitarization were redirected in fiscal year 2002 by DOD to pay for $40.5 million for additional community protection equipment for Anniston. This was an unfunded budget expense, and the Army reduced funds for the Pine Bluff site by $14.9 million, contributing to construction and systemization milestones slipping 1 year. The Pine Bluff site was selected because the loss of funding would not delay the projected start of operations during that fiscal year. Program officials told us that the total program cost of this schedule slip would ultimately be $90 million. Additionally, funds were reduced for the Johnston Atoll site by $25.1 million because it was in closure.

According to an Army official, delays increase program costs by approximately $250,000 to $300,000 a day or about $10 million per month. Since 2001, delays have caused cost increases of $256 million at the incineration sites shown in table 7.

Table 7: Program Cost Increases Resulting from Delays at Incineration Sites

Dollars in millions		
Incineration site	**Cause of delay**	**Cost increase**
Johnston Atoll	Funding	$26
Tooele	Incident during operation	75
Anniston	Environmental permitting	45
Umatilla	Environmental permitting	20
Pine Bluff	Funding	90
Total		**$256**

Source: GAO analysis of U.S. Army data.

Note: Data as of March 2003.

Due to the delays, the Army is in the process of developing new milestones that would extend beyond those adopted in 2001. According to an Army official, the program will use events that have occurred since 2001 to present new cost estimates to DOD in preparation for the fiscal year 2005 budget submission. Program officials told us that they estimate costs have already increased $1.2 billion. This estimated increase is likely to rise further as additional factors are considered.

Delays at Neutralization Sites Have Not Led to Missed Milestones

The two bulk-agent only sites, Aberdeen and Newport, have experienced delays but have not breeched their milestones. The schedules were revised in response to concerns about the continued storage of the chemical stockpile after the events of September 11, 2001. In 2002, DOD approved the use of a modified process that will accelerate the rate of destruction at these two sites. For example, the Army estimates that the modified process will reduce the length of time needed to complete destruction of the blister agent stockpile at Aberdeen from 20 months to 6 months. The Army estimates that this reduction, along with other changes, such as the off-site shipping of a waste byproduct, will reduce the scheduled end of operations by 5 years, from 2008 to 2003. Similarly, projections for agent destruction operations at Newport were reduced from 20 months to 7 months, and the destruction end date moved up from 2009 to 2004.

While the Aberdeen site did begin destruction operations, as of June 2003, it had only achieved a peak rate of 2 containers per day, which is far less than the projected peak daily rate of 12, and had experienced unanticipated problems removing residual agent from the containers. After 2 months of processing, Army officials said it had initially processed 57 of the 1,815 containers in Aberdeen's stockpile and will have to do additional processing of these containers because of a higher amount of unanticipated hardened agent. Even if the peak daily rate of 12 is achieved, the site will not meet the October 2003 Army estimate.

At the Newport site, construction problems will delay the start of operations, missing the program manager's October 2003 estimate for starting agent destruction operations. Another possible impediment to starting operations is the program's efforts to treat the waste byproduct at a potential off-site disposal facility in Ohio. These efforts have met resistance from some community leaders and residents near the potential disposal site. If the Army is unable to use an off-site facility, the disposal may have to be done on site, requiring the construction of a waste byproduct treatment facility, further causing delays and increasing costs.

Schedule milestones were not adopted for the Pueblo and Blue Grass sites in the 2001 schedule because DOD had not selected a destruction technology. Subsequently, DOD selected destruction technologies for these sites; however, these decisions were made several months beyond the dates estimated in 2001. For example, while program officials indicated that the technology decision for the Kentucky site would be made by September 2002, the decision was not made until February 2003. Significantly, DOD announced initial schedule milestones for these two sites that extended beyond the extended April 2012 deadline of the CWC. According to DOD officials, these schedules are preliminary and will be reevaluated after the selected contractors complete their initial design of the facilities. Plans for these sites are immature, and changes are likely to occur as they move closer to the operations phase still at least several years away.

Risk Management Approach Needed to Reduce Schedule Delays

DOD and the Army have not implemented a comprehensive risk management approach that would proactively anticipate and influence issues that could adversely affect the program's progress. The program manager's office drafted a risk management plan in June 2000, but the plan has not been formally approved or implemented. According to program officials, a prior program official drafted the plan and subsequent officials did not approve or further develop the plan. The draft plan noted that DOD's acquisition rules require program managers to establish a risk management plan to identify and control risk related to performance, cost, and schedule.[27]

Such a plan would allow managers to systematically identify, analyze, and influence the risk factors and could help keep the program within its schedule and cost estimates.

DOD and Army officials have given several reasons for not having an overall risk management plan. A DOD official indicated that the approach that has been used to address program problems has been crisis management, which has forced DOD to react to issues rather than control them. The deputy program manager stated that the program's focus has been on managing individual sites by implementing initiatives to improve contractor performance as it relates to safety, schedule, and cost. The

[27] Interim Defense Acquisition Guidebook, Oct. 30, 2002 (formerly DOD 5000.2-R, Apr. 5, 2002).

official also said that establishing a formal, integrated risk management plan has not been a priority. However, an official from the program manager's office said the infrastructure is in place to finalize an integrated risk management plan by October 2003, which coincides with the date CMA takes over leadership of the program. However, due to the transition that the organization is undergoing, the status of this effort is uncertain.

The Army defines its risk management approach as a process for identifying and addressing internal and external issues that may have a negative impact on the program's progress. A risk management approach has five basic steps, which assist program leaders in effective decision making for better program outcomes. Simply stated, the first step is to identify those issues that pose a risk to the program. For example, a problem in environmental permitting can significantly delay the program schedule. The second step is to analyze the risks identified and prioritize the risks using established criteria. The third step is to create a plan for action to mitigate the prioritized risks in some order of importance. The fourth step is to track and validate the actions taken.

The last step is to review and monitor the outcomes of the actions taken to ensure their effectiveness. Additional remedies may be needed if actions are not successful or the risks have changed. Risk management is a continuous, dynamic process and must become a regular part of the leadership decision process. Without developing such an approach, the Chem-Demil Program will continue to manage by addressing issues as they arise and not by developing strategies or contingency plans to meet program issues. As the program complexity increases with new technologies and more active sites, a comprehensive risk management approach, as the acquisition regulations require, would facilitate program success and help control costs. Such a proactive approach would allow the program to systematically identify, analyze, and manage the risk factors that could hamper its efforts to destroy the chemical stockpile and help keep it within its schedule and cost estimates.

Conclusions

For more than a decade, the Chem-Demil Program has struggled to meet schedule milestones—and control the enormous costs—for destroying the nation's chemical weapons stockpile. The program will also miss future CWC deadlines. Despite several reorganizations of its complex structure, the program continues to flounder. Program leadership at both the oversight and the program manager levels has shifted frequently, contributing to the program's continued instability, ineffective decision making, and weak accountability. The repeated realignments of

the program have done little to resolve its awkward, hydra-like structure in which roles and responsibilities continue to be poorly defined, multiple lines of authority exist, and coordination between various entities is poor. These shifts and realignments have taken place without the benefit of a comprehensive strategy and an implementation plan that could help the program clearly define its mission and begin working toward its goals effectively. If the program had these key pillars, such as a strategy to guide it from its inception and an implementation plan to track performance, it would be in a better position to achieve desired outcomes. The program will have a low probability of achieving its principal goal of destroying the nation's chemical weapons stockpile in a safe manner within the 2001 schedule unless DOD and Army leadership take immediate action to clearly define roles and responsibilities throughout the program and implement an overarching strategic plan.

The Chem-Demil Program is entering a crucial period as more of its sites move into the operations phase. As this occurs, the program faces potentially greater challenges than it has already encountered, including the possibilities of growing community resistance, unanticipated technical problems, and serious site incidents. Unless program leadership is proactive in identifying potential internal and external issues and preparing for them, or in reducing the chances that they will occur, the program remains at great risk of failing to meet its scheduled milestones and the deadlines set by the CWC. These problems, and subsequent delays, are likely to continue plaguing the program unless it is able to incorporate a comprehensive risk management system into its daily routine. Such a proactive approach would allow the program to systematically identify, analyze, and manage the risk factors that could hamper its efforts to destroy the chemical stockpile and help keep it within its schedule and cost estimates. Without the advantage of having a risk management tool, the program will continue to be paralyzed by delays caused by unanticipated issues, resulting in spiraling program costs and missed deadlines that prolong the dangers of the chemical weapons stockpile to the American public.

Recommendations for Executive Action

We recommend that the Secretary of Defense direct the Under Secretary of Defense for Acquisition, Technology and Logistics, in conjunction with the Secretary of the Army, to

- develop an overall strategy and implementation plan for the chemical demilitarization program that would:
  - articulate a program mission statement,
  - identify the program's long-term goals and objectives,
  - delineate the roles and responsibilities of all DOD and Army offices, and
  - establish near-term performance measures, and
- implement a risk management approach that anticipates and influences internal and external factors that could adversely impact program performance.

Agency Comments and Our Evaluation

In written comments on a draft of this report, DOD concurred with our recommendations. In concurring with our recommendation to develop an overall strategy and implementation plan, DOD stated that it is in the initial stages of developing such a plan and estimates that it will be completed in fiscal year 2004. In concurring with our recommendation to implement a risk management approach, DOD stated that the CMA will review the progress of an evaluation of several components of its risk management approach within the next 120 days. At that time, DOD will evaluate the outcome of this review and determine any appropriate action.

We believe these actions should improve program performance provided DOD's plan incorporates a clearly articulated mission statement, long-term goals, well-delineated assignment of roles and responsibilities, and near-term performance measures and the Army's review of its risk management approach focuses on anticipating and influencing internal and external factors that could adversely impact the Chem-Demil Program.

DOD's comments are printed in appendix III. DOD also provided technical comments that we incorporated where appropriate.

We are sending copies of this report to the appropriate congressional committees; the Secretary of Defense; the Under Secretary of Defense for Acquisition, Technology and Logistics; the Secretary of the Army; and the Director, Office of Management and Budget. We will make copies available

to others upon request. In addition, the report will be available at no charge on the GAO Web site at http://www.gao.gov.

For any questions regarding this report, please contact me at (512) 512-6020. Key contributors to this report were Donald Snyder, Rodell Anderson, Bonita Oden, John Buehler, Pam Valentine, Steve Boyles, Nancy Benco, and Charles Perdue.

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Appendix I: Scope and Methodology

This report focuses on the Chemical Demilitarization (Chem-Demil) Stockpile Program, one of the components of the Chem-Demil program. Other components, such as the Chemical Stockpile Emergency Preparedness Program, were only discussed to determine their effects on the destruction schedule.

To determine if recent changes in the stockpile program's management and oversight have been successful in improving program progress, we interviewed numerous officials and reviewed various documents. Through a review of previous and current organizational charts, we noted a number of changes in the program from 1986 to the present. We interviewed Department of Defense (DOD) and Army officials to determine what effect organizational changes and management initiatives had on the program and to determine if a strategic plan had been developed to manage the program. We identified organizational changes between DOD and the Army, determined the rationale for changes, and ascertained the effect of these changes on program performance. We reviewed Defense Acquisition System directives to determine the roles and responsibilities of DOD and the Army in managing the Chemical Demilitarization Program. We assessed Chem-Demil Program's Acquisition Strategy and Management and Program Performance plans to identify elements of a strategic plan and evaluated and compared them to the general tenets and management principles embraced by the Government Performance and Results Act. Additionally, we interviewed Office of Management and Budget officials to discuss their assessment of the program's performance and its adherence to a results-oriented management approach and reviewed DOD directives and regulations to determine the criteria for strategic planning.

To determine the progress that DOD and the Army have made in meeting revised 2001 cost and schedule estimates and Chemical Weapons Convention (CWC) deadlines, we interviewed relevant program officials and reviewed a number of documents. We reviewed the Army's current program office estimates to destroy the chemical weapons stockpile and weekly and monthly destruction schedules to understand how sites will perform and synchronize activities to meet milestones. We interviewed DOD's Cost Analysis Improvement Group to determine how DOD developed estimates for the 2001 milestone schedules for each site. However, we did not independently evaluate the reliability of the methodology the Cost Analysis Improvement Group used to develop its estimate. Further, we interviewed program officials to determine the status of the destruction process at incineration and neutralization sites and the impact of delays on schedule and cost.

We reviewed Selected Acquisition Reports and Acquisition Program Baselines to identify the increase in program cost estimates in 1998 and 2001 and to determine the relationship between changes to schedule milestones and increased program cost. Our analysis identified the effect that schedule delays would have on schedule milestones at incineration and neutralization sites. Additionally, the analysis also identified types of schedule delays and the impact on program cost. Through interviews with program officials, we discussed the status of factors that increase program life-cycle cost estimates. We examined the Chem-Demil Program's draft risk management plans to determine if the Army had developed a comprehensive risk management approach to address potential problems that could adversely affect program schedules, cost, and safety. Through an analysis of other risk management plans, we identified elements of a risk management process. We reviewed CWC documents to determine deadlines for the destruction of the chemical weapons stockpile. We interviewed program officials to discuss the potential implications of not meeting interim milestones and CWC deadlines.

During the review, we visited and obtained information from the Office of the Secretary of Defense, the Assistant Secretaries of the Army (Installations and Environment) and (Acquisition, Logistics, and Technology); the Office of Management and Budget, the Department of State, the Federal Emergency Management Agency, and the DOD Inspector General in Washington, D.C. and met with the Director of Chemical Materials Agency and the Program Managers for Chemical Demilitarization and Assembled Chemical Weapons Assessment in Edgewood, Maryland. We also met project managers, site project managers, state environmental offices, and contractors associated with disposal sites in Aberdeen, Maryland; Anniston, Alabama; Umatilla, Oregon; and Pine Bluff, Arkansas. We also interviewed Federal Emergency Management Agency officials concerning funding of emergency preparedness program activities.

We conducted our review from August 2002 to June 2003 in accordance with generally accepted government auditing standards.

Appendix II: Major Schedule Phases Associated with Chemical Demilitarization Process and Current Facility Status

When developing schedules, the Army divides the demilitarization process into five major phases. The five major phases are facility design, construction, systemization, operations, and closure. Some activities of one phase may overlap the preceding phase. The nine sites are at different phases of the process.

The Army's Demilitarization Process

Design

During the design phase, the Army obtains the required environmental permits. The permits are required to comply with federal, state, and local environmental laws and regulations to build and operate chemical disposal facilities. The permits specify construction parameters and establish operations guidelines and emission limitations. Subsequent engineering changes to the facility are incorporated into the permits through formal permit modification procedures. During this phase, the Army originally solicited contract proposals from systems contractors to build, and operate, the chemical demilitarization facility and selected a systems contractor. Now, the Army uses a design/build approach, whereby the contractor completes both phases. The Army originally provided the systems contractors with the design for the incineration facilities; however, systems contractors developed the facility design for the neutralization facilities.

Construction

During the construction phase, the Army, with the contractor's input, develops a master project schedule that identifies all major project tasks and milestones associated with site design, construction, systemization, operations, and closure. For each phase in the master project schedule, the contractor develops detailed weekly schedules to identify and sequence the activities necessary to meet contract milestones. Army site project managers review and approve the detailed schedules to monitor the systems contractor's performance. After developing the schedules, the contractor builds a disposal site and acquires, installs, and integrates the necessary equipment to destroy the stockpile and begins hiring, training, and certifying operations staff.

Systemization

During systemization, the systems contractor also prepares and executes a systemization implementation plan, which describes how the contractor will ensure the site is prepared to conduct agent operations. The

contractor begins executing the implementation plan by testing system components. The contractor then tests individual systems to identify and correct any equipment flaws. After systems testing, the contractor conducts integrated operations tests. For example, the contractor uses simulated munitions to test the rocket processing line from receipt of the munitions through incineration. Army staff observe and approve key elements of each integrated operations test, which allows the contractor to continue the systemization process. Once the Army approves the integrated operations test, the contractor tests the system by conducting mini and surrogate trial burns. During minitrial burns, the contractor adds measured amounts of metals to a surrogate material to demonstrate the system's emissions will not exceed allowable rates. In conducting surrogate trial burns, the contractor destroys nonagent compounds similar in makeup to the agents to be destroyed at the site. By using surrogate agents, the contractor tests destruction techniques without threatening people or the environment. Both the minitrial burn test results and the surrogate trial burn test results are submitted to environmental regulators for review and approval. When the environmental regulators approve the surrogate trial burns, the contractor conducts an Operational Readiness Review to validate standard operating procedures and to verify the proficiency of the workforce. During the Operational Readiness Review, the workforce demonstrates knowledge of operating policies and procedures by destroying simulated munitions. After systemization, the contractor begins the operations phase; that is, the destruction of chemical munitions.

Operations

The operations phase is when weapons and agents are destroyed. Weapons are destroyed by campaign, which is the complete destruction of like chemical weapons at a given site. Operations for incineration and alternative technologies differ. The following examples pertain to an incineration site. In its first campaign, Umatilla plans to destroy its stockpile of M55 rockets filled with one type of nerve agent. Then a second campaign is planned to destroy its stockpile of M55 rockets filled with another type of nerve agent. After each campaign, the site must be reconfigured. The Army refers to this process as an agent changeover. During the changeover, the contractor decontaminates the site of any prior nerve agent residue. The contractor then adjusts the monitoring, sampling, and laboratory equipment to test for the next nerve agent. The contractor also validates the operating procedures for the second agent destruction process. Some operating procedures may be rewritten because the processing rates among chemical agents differ. Although the operations

staff have been trained and certified on specific equipment, the staff are re-trained on the operating parameters of processing VX agent.

In the third and forth campaigns at Umatilla, the contractor plans to destroy 8-inch VX projectiles and 155-millimeter projectiles, respectively. Because the third campaign involves a different weapon than the second campaign (i.e., from rockets in the second campaign to projectiles in the third campaign), the contractor will replace equipment during the changeover. For example, the machine that disassembles rockets will be replaced with a machine that disassembles projectiles. Additionally, a changeover may require certain processes to be bypassed. For instance, if a changeover involved changing processes from weapons with explosives to weapons without explosives, the explosives removal equipment and deactivation furnace would be bypassed. For the changeover to the fourth campaign at Umatilla, the contractor will adjust equipment to handle differences in weapon size. For example, the contractor will adjust the conveyor system to accommodate the 155-millimeter projectiles. The contractor also will change the location of monitoring equipment.

Closure

After destruction of the stockpile, the systems contractor begins closing the site. During the closure phase, the contractor decontaminates and disassembles the remaining systems, structures, and components used during the demilitarization effort, and the contractor performs any other procedures required by state environmental regulations or permits. The contractor removes, disassembles, decontaminates, and destroys the equipment, including ancillary equipment such as pipes, valves, and switches. The contractor also decontaminates buildings by washing and scrubbing concrete surfaces. Additionally, the contractor removes and destroys the surface concrete from the walls, ceilings, and floors. With the exception of the Umatilla site, the structures will remain standing. Any waste generated during the decontamination process is destroyed.

Status of the Demilitarization Sites

The Army's nine chemical demilitarization sites are in different phases of the demilitarization process. The Johnston Atoll site completed the destruction of its stockpile and closure is almost complete. The sites at Tooele, Utah, and Aberdeen, Maryland, are in the operations phase, each using different technologies, to destroy chemical agent and munitions. The remaining six facilities are in systems design, construction and/or systemization. Table 8 provides details on the status of each of the nine chemical demilitarization sites.

Table 8: Status of Chemical Demilitarization Facilities

Incineration site	Current phase	Status as of June 30, 2003
Johnston Atoll	Closure	• The Army completed operations in November 2000 and began closure activities in January 2001. • The DOD schedule milestone to complete closure is September 2003; however, the Army expects to complete closure in January 2004.
Tooele, Utah	Operations	• The Army began operations in August 1996. • After a 9-month shutdown, operations resumed in March 2003. Operations were suspended from July 2002 to March 2003 because a worker was exposed to chemical agent. • Subsequent to resuming operations in March 2003, the Army suspended agent operations five times, for a total of 12 days. The suspensions occurred because of various operational problems including: contamination of an agent collection tank, air monitors erroneously reporting the presence of agent, problems associated with processing spent decontaminate solution, a power outage, and a chemical event. • The DOD schedule milestone to complete operations is February 2008; however, the Army expects to complete operations in January 2006. • The DOD schedule milestone to complete closure is September 2010; however, the Army expects to complete closure in May 2008.
Anniston, Ala.	Systemization	• The Army completed systemization in January 2003. However, due to congressional concerns that the Chemical Stockpile Emergency Preparedness Program (CSEPP) had not adequately prepared the community for an accidental release of agent, the Army did not begin agent operations as planned and agreed to address the following four CSEPP issues before beginning operations: (1) overpressurize schools and community facilities located within a 12-mile radius of the stockpile, (2) establish protection for individuals who are unable to carry out protective action recommendations because of disability, illness, inability to understand instructions in English, or are underage and unattended, (3) assume responsibility for turning on the sirens for zones located closest to the Anniston Army Depot, and (4) use the Environmental Protection Agency's new Acute Exposure Guideline Levels. • On June 5, 2003, the Army sent official 30-day notification, as required, to Congress that the site is ready to begin operations. • The DOD schedule milestone to complete operations is May 2011; however, the Army expects to complete operations in July 2009. • The DOD schedule milestone to complete closure is December 2013; however, the Army expects to complete closure in November 2011.
Umatilla, Oreg.	Systemization	• The DOD schedule milestone to start operations is July 2003; however, the Army now expects to begin operations in December 2003 because of a minitrial burn failure. • The Army is conducting surrogate trial burns, which are expected to be complete in August 2003. • The DOD schedule milestone to complete operations is January 2011; however, the Army expects to complete operations in May 2009. • The DOD schedule milestone to complete closure is June 2014; however, the Army expects to complete closure in February 2012.

Incineration site	Current phase	Status as of June 30, 2003
Pine Bluff, Ark.	Systemization	• The DOD schedule milestone to begin operations is October 2003; however, because of funding reductions, the Army expects to begin operations in April 2004. • The Army is conducting systems testing, which is expected to be complete in August 2003. • The Army expects to begin surrogate trial burns in June 2003 and complete the trial burns in April 2004. • The DOD schedule milestone to complete operations is November 2009; however, the Army expects to complete operations in January 2009. • The DOD schedule milestone to complete closure is December 2011; however, the Army expects to complete closure in December 2010.
Neutralization site		
Aberdeen, Md.	Operations	• The Army began operations in April 2003 and the DOD schedule milestone to complete operations is March 2004; however, the Army expects to complete operations in September 2003. • The DOD schedule milestone to complete closure is December 2006; however, the Army expects to complete closure in July 2005.
Newport, Ind.	Systemization	• The Army began systemization in September 2002 and the DOD schedule milestone to complete systemization is February 2005; however, the Army expects to complete systemization in October 2003. • The DOD schedule milestone to start operations is February 2005; however, the Army expects to start operations in October 2003. The DOD schedule milestone to complete operations is January 2006; however, the Army expects to complete operations by April 2004. • The DOD schedule milestone to complete closure is April 2009; however, the Army expects to complete closure in September 2006.
Pueblo, Colo.	Design	• The Army awarded a systems contract in September 2002 to design a demilitarization site. • The Army is reviewing a proposed design and build plan with the systems contractor. After the Army approves the design and build plan, the contractor will begin site preparation activities. • The DOD schedule estimates operations will be completed by April 2010. (The Army has not developed an estimated destruction schedule.)
Blue Grass, Ky.	Design	• The Army solicited systems contractor proposals in February 2003. • The Army selected a systems contractor in June 2003. • The DOD schedule estimates operations will be completed by May 2014. (The Army has not developed an estimated destruction schedule.)

Source: GAO analysis of U.S. Army data.

Appendix III: Comments from the Department of Defense

ASSISTANT TO THE SECRETARY OF DEFENSE
3050 DEFENSE PENTAGON
WASHINGTON, DC 20301-3050

NUCLEAR AND CHEMICAL
AND BIOLOGICAL DEFENSE
PROGRAMS

18 AUG 2003

Mr. Raymond J. Decker
Director, Defense Capabilities and Management
U.S. General Accounting Office
441 G Street, N.W.
Washington, DC 20548

Dear Mr. Decker:

This is the Department of Defense (DoD) response to the GAO draft report GAO-03-1031, *CHEMICAL WEAPONS: Sustained Leadership Along With Key Strategic Management Tools Are Needed to Guide DOD's Destruction Program*, dated July 30, 2003.

Thank you for providing us the opportunity to review your draft report. We understand your stated concerns, and will weigh each recommendation during all upcoming management and programmatic reviews. We reviewed the subject document and provide the attached comments to the recommendations and recommended administrative changes.

Patrick J. Wakefield
Deputy Assistant to the Secretary of Defense
(Chemical Demilitarization & Threat Reduction)

Enclosure

1

GAO DRAFT REPORT - DATED JULY 30, 2003
GAO CODE 350255/GAO-03-1031

"CHEMICAL WEAPONS: SUSTAINED LEADERSHIP ALONG WITH KEY STRATEGIC MANAGEMENT TOOLS ARE NEEDED TO GUIDE DOD'S DESTRUCTION PROGRAM"

DEPARTMENT OF DEFENSE COMMENTS TO THE RECOMMENDATIONS

RECOMMENDATION 1: The GAO recommended that the Secretary of Defense direct the Under Secretary of Defense for Acquisition, Technology and Logistics, in conjunction with the Secretary of the Army, to develop an overall strategy and implementation plan for the chemical demilitarization program that would:

0 articulate a program mission statement,
0 identify the program's long-term goals and objectives,
0 delineate the roles and responsibilities of all DOD and Army offices, and
0 establish near-term performance measures. (p. 28/GAO Draft Report)

DOD RESPONSE: Concur. DoD is in the initial stages of planning this document. Preliminary estimated completion date is second quarter fiscal year 2004.

RECOMMENDATION 2: The GAO recommended that the Secretary of Defense direct the Under Secretary of Defense for Acquisition, Technology and Logistics, in conjunction with the Secretary of the Army, to implement a risk management approach that anticipates and influences internal and external factors that could adversely impact program performance. (p. 28/GAO Draft Report)

DOD RESPONSE: Concur. The Army Chemical Materials Agency is evaluating several components of their risk management approach and will review their progress within the next 120 days. DoD will evaluate the outcome of this review and determine the appropriate action.

2

Related GAO Products

Chemical Weapons: Lessons Learned Program Generally Effective but Could Be Improved and Expanded. GAO-02-890. Washington, D.C.: September 10, 2002.

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Chemical Weapons Stockpile: Changes Needed in the Management of the Emergency Preparedness Program. GAO/NSIAD-97-91. Washington, D.C.: June 11, 1997.

Chemical Weapons and Materiel: Key Factors Affecting Disposal Costs and Schedule. GAO/T-NSIAD-97-118. Washington, D.C.: March 11, 1997.

Chemical Weapons Stockpile: Emergency Preparedness in Alabama Is Hampered by Management Weaknesses. GAO/NSIAD-96-150. Washington, D.C.: July 23, 1996.

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Chemical Weapons: Stability of the U.S. Stockpile. GAO/NSIAD-95-67. Washington, D.C.: December 22, 1994.

Chemical Weapons Disposal: Plans for Nonstockpile Chemical Warfare Materiel Can Be Improved. GAO/NSIAD-95-55. Washington, D.C.: December 20, 1994.

Chemical Weapons: Issues Involving Destruction Technologies. GAO/T-NSIAD-94-159. Washington, D.C.: April 26, 1994.

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Chemical Weapons Storage: Communities Are Not Prepared to Respond to Emergencies. GAO/T-NSIAD-93-18. Washington, D.C.: July 16, 1993.

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Chemical Warfare: DOD's Effort to Remove U.S. Chemical Weapons From Germany. GAO/NSIAD-91-105. Washington, D.C.: February 13, 1991.

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Chemical Weapons: Stockpile Destruction Delayed at the Army's Prototype Disposal Facility. GAO/NSIAD-90-222. Washington, D.C.: July 30, 1990.

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