

May 2006

# COOPERATIVE THREAT REDUCTION

## DOD Needs More Reliable Data to Better Estimate the Cost and Schedule of the Shchuch'ye Facility



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# Highlights

Highlights of [GAO-06-692](#), a report to the Chairman, Subcommittee on Federal Financial Management, Government Information and International Security, Committee on Homeland Security and Governmental Affairs, U.S. Senate

## Why GAO Did This Study

Until destroyed, Russia's stockpile of chemical weapons remains a proliferation threat, vulnerable to theft and diversion. Since 1992, Congress has authorized the Department of Defense (DOD) to provide more than \$1 billion for the Cooperative Threat Reduction (CTR) program to help the Russian Federation construct a chemical weapons destruction facility (CWDF) at Shchuch'ye to eliminate about 14 percent of its stockpile. Over the past several years, DOD has faced numerous challenges that have increased the estimated cost of the facility from about \$750 million to more than \$1 billion and delayed the facility's operation from 2006 until 2009. DOD has attributed the increase cost and schedule to a variety of factors. In this report, we (1) assess the facility's progress, schedule, and cost and (2) review the status of Russia's efforts to destroy all of its chemical weapons.

## What GAO Recommends

GAO recommends that the Secretary of Defense direct the Defense Threat Reduction Agency and the U.S. Army Corps of Engineers to (1) ensure that the EVM system contains valid and reliable data, (2) set aside a portion of the contractor's award fee until the EVM system produces reliable data, and (3) require the contractor to perform an integrated baseline review (IBR) after awarding the contract for completing Building 101. DOD concurred with our recommendation.

[www.gao.gov/cgi-bin/getrpt?GAO-06-692](http://www.gao.gov/cgi-bin/getrpt?GAO-06-692).

To view the full product, including the scope and methodology, click on the link above. For more information, contact Joseph Christoff at (202) 512-8979 or [christoffj@gao.gov](mailto:christoffj@gao.gov).

## COOPERATIVE THREAT REDUCTION

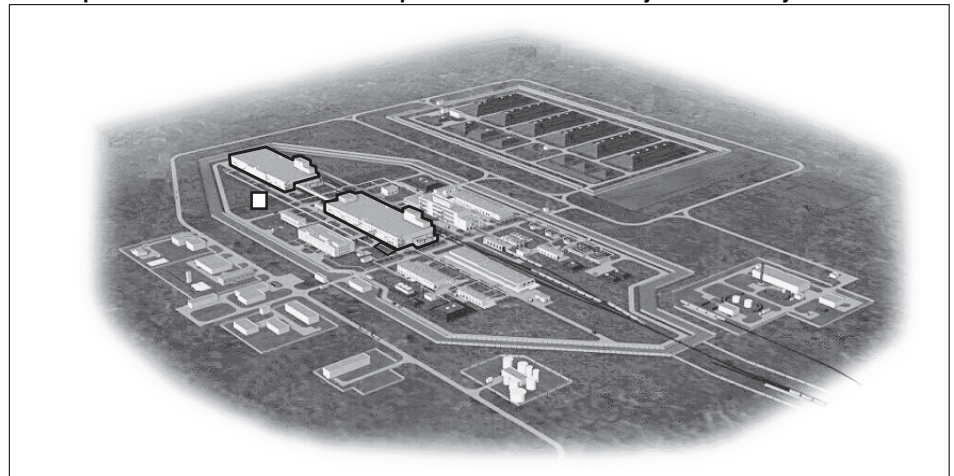
# DOD Needs More Reliable Data to Better Estimate the Cost and Schedule of the Shchuch'ye Facility

## What GAO Found

Although DOD has made visible progress over the past 2 years in constructing the chemical weapons destruction facility at Shchuch'ye, it continues to face numerous challenges that threaten the project's schedule and cost. Primarily, key buildings on the site have fallen behind schedule due to difficulties working with Russian subcontractors. Such delays have been costing DOD more than \$3 million per month since October 2005 and will continue until the award of a crucial subcontract, possibly in June 2006. Uncertain progress of Russian construction on the site, unpredictable Russian regulatory requirements, and various technical issues, such as testing the facility, could cause further schedule delays and increase costs. Also, DOD lacks a reliable earned value management (EVM) system to record, predict, and monitor the project's progress. DOD allocated \$6.7 million to the project's contractor in September 2004 to establish an EVM system and expected to have a validated EVM system in place by March 2005. DOD cannot use the current EVM system to assess the final schedule and cost for completing the Shchuch'ye facility because it contains flawed and unreliable data. In addition, the contractor has not yet conducted an IBR of the Shchuch'ye project.

Furthermore, it remains uncertain whether the Russian government can destroy its entire chemical weapons stockpile by the Chemical Weapons Convention (CWC) extended deadline of 2012. As of March 2006, Russia had destroyed about 3 percent of its 40,000 metric tons of chemical weapons at two completed destruction facilities. To eliminate the remainder of its chemical weapons over the next six years, the Russian government must construct and operate five additional destruction facilities, including Shchuch'ye. The Russian government has indicated that it will need continued international assistance to destroy the remaining stockpile.

Site Map of the Planned Chemical Weapons Destruction Facility at Shchuch'ye



Source: DOD.

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### Abbreviations

CTR	Cooperative Threat Reduction
CWC	Chemical Weapons Convention
CWDF	chemical weapons destruction facility
DCAA	Defense Contract Audit Agency
DCMA	Defense Contract Management Agency
DOD	Department of Defense
DTRA	Defense Threat Reduction Agency
EVM	Earned Value Management
FAR	Federal Acquisition Regulation
IBR	integrated baseline review
RFP	Requests for Proposal
Rostekhnadzor	Federal Service for Ecological, Technological, and Nuclear Oversight
VAT	value added tax

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United States Government Accountability Office  
Washington, DC 20548

May 31, 2006

The Honorable Tom Coburn  
Chairman  
Subcommittee on Federal Financial Management,  
Government Information, and International Security  
Committee on Homeland Security and Governmental Affairs  
United States Senate

Dear Mr. Chairman:

Russia possesses the world's largest declared chemical weapons stockpile. Since 1992, Congress has authorized the Department of Defense (DOD), through its Cooperative Threat Reduction (CTR) program to provide the Russian Federation more than \$1 billion to eliminate these weapons. The majority of these funds support the construction of a chemical weapons destruction facility (CWDF) at Shchuch'ye, Russia. The facility is designed to destroy about 14 percent of Russia's chemical weapons stockpile. In 1999, DOD estimated that the destruction facility would cost about \$750 million and could begin destroying chemical weapons in 2006. However, by 2003, DOD determined that the facility would cost more than \$1 billion and would not be operational until 2009. DOD has attributed the increased cost and schedule to a variety of risk factors, including changing requirements and congressional restrictions on construction funding.

In this report, we (1) assess the facility's progress, schedule, and cost and (2) review the status of Russia's efforts to destroy all its chemical weapons. To assess the progress of the facility, we obtained information from U.S. government officials and representatives of Parsons Global Services, Inc., (Parsons) the contractor managing the construction at Shchuch'ye. We also collected and analyzed DOD and contractor documents and met with relevant officials. Furthermore, we analyzed the reliability of Parsons' Earned Value Management (EVM) system data for the facility. A DOD-required management tool, an EVM system measures performance by comparing the value of work accomplished with work scheduled and thereby provides early warning of schedule delays and cost overruns. To obtain information on Russia's chemical weapons destruction efforts, we met with Russian government and international donor officials and reviewed copies of pertinent documents, including the Russian chemical weapons destruction plan. We performed our work from June 2005 through May 2006 in accordance with generally accepted

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government auditing standards. (See app. 1 for details on our scope and methodology.)

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## Results in Brief

Since our last visit to the site in November 2003, DOD and Parsons have made progress in constructing the CWDF at Shchuch'ye. For example, several buildings are at or near completion, including the fire station, housing complex, and warehouse. However, DOD faces substantial challenges that could threaten the project's cost and schedule. First, the construction of key buildings is behind schedule. The construction of the main destruction building is delayed due to subcontractor bids that were incomplete or excessively high. The control building is behind schedule because a major Russian subcontractor went bankrupt. As of February 2006, DOD estimated that the construction of the entire CWDF was about 40 percent complete, compared with the more than 52 percent scheduled for completion at that time. Second, uncertain progress of Russian construction of utilities (electricity, water, and gas) required to operate the facility could delay the destruction process. Third, a new Russian regulatory agency has levied additional and unplanned safety and administrative requirements on the project. In addition, potential difficulties in implementing the next critical step—systemization—in which all of the facility's components (destruction, electrical, water, etc.) are tested to ensure interoperability and performance—could impact cost and schedule. While DOD estimates that it will turn over the Shchuch'ye facility to the Russian government in December 2009, such an estimate appears optimistic given the construction and other unknown delays DOD may encounter. Furthermore, the EVM system that Parsons is using to record, predict, and monitor progress contains flawed and unreliable data. Our analysis revealed serious discrepancies in the data, such as improper calculations and accounting errors. For example, we found that from September 2005 through January 2006 Parsons' EVM reports did not capture almost \$29 million in actual costs for the CWDF project. In addition, we found that DOD and Parsons have not yet conducted an integrated baseline review (IBR) for the Shchuch'ye project.

To improve DOD's efforts to accurately measure progress on the Shchuch'ye project and estimate its final completion date and cost, we are recommending that the Secretary of Defense ensure that Parsons' EVM system contains valid, reliable data and that it reflects actual cost and schedule conditions. Until Parsons' system produces reliable EVM data, we are also recommending that the Secretary of Defense withhold a portion of Parsons' award fee. Finally, we are recommending that the

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Secretary of Defense require Parsons to perform an IBR of the Shchuch'ye project once the contract for completing Building 101 has been awarded.

DOD concurred with our recommendation regarding the improvement of Parsons' EVM system data and provided technical comments that we incorporated where appropriate. The Department of State did not provide comments.

In addition to the Shchuch'ye project, the Russian government has ambitious plans to eliminate its chemical weapons stockpile. Since 2002, Russia has destroyed about 3 percent of its declared 40,000 metric tons of chemical weapons at two completed destruction facilities. To eliminate the remaining stockpile and meet the Chemical Weapons Convention (CWC) extended deadline of 2012, the Russian government will have to destroy about 38,000 metric tons of chemical weapons. The Russian government's destruction plan to eliminate all chemical weapons by 2012 may be unrealistic as it depends on the construction of seven destruction facilities—two have been built, two are under construction, and three have not been started. Furthermore, the Russian government's priority is to destroy nerve agents contained in large munitions, because destroying the larger-sized munitions first would allow Russia to meet its CWC destruction deadlines faster. Accordingly, the destruction of smaller munitions at Shchuch'ye may become less of a priority for the Russian government. In addition, the Russian government has indicated that it will need continued international assistance to destroy the remaining stockpile. Its destruction plan estimates that about \$5.6 billion is needed to eliminate the entire Russian stockpile. Since 2002, international donors, including the United States, have committed almost \$2 billion for Russian chemical weapons destruction efforts.

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## Background

Russia possesses the world's largest declared chemical weapons stockpile, which is stored at seven sites across the country (see fig. 1). When declared in 1998, the Russian stockpile included 32,500 metric tons of nerve agents and 7,500 metric tons of blister agents.<sup>1</sup> As of March 2006, Russia had destroyed about 1,158 metric tons of blister agents, about 3 percent of its stockpile. Under the CWC, Russia must destroy all of its

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<sup>1</sup>Nerve agents affect the transmission of nerve impulses in the nervous system. Nerve agents are easily dispersed and highly toxic when absorbed through the skin or via respiration. Blister agents, which can be lethal if inhaled, generally cause burns on contact with skin. The blister agents include mustard gas and lewisite.

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chemical weapons by the extended deadline of 2012.<sup>2</sup> The CWC is a multilateral arms control treaty that bans the development, production, stockpiling, transfer, and use of chemical weapons and requires the destruction of existing chemical weapons stocks. Until destroyed, chemical weapons remain a proliferation threat.

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<sup>2</sup>The CWC requires the destruction of existing chemical weapons stocks and production facilities by 2007 with a possible extension to 2012.



**Figure 1: Russian Chemical Weapons Stockpile**



Sources: DOD (data); Nova Development and Map Resources (images).

In 1992, the United States agreed to assist the Russian government in eliminating its chemical weapons stockpile. The United States has committed to fund the design, construction, equipment acquisition and installation, systems integration, training, and start-up of the Shchuch'ye facility. When completed, the facility will house about 100 buildings and structures, including the destruction buildings where chemical munitions

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are destroyed; the administration building where the destruction process is controlled; and support buildings such as the boiler house, which provides heat to the entire facility. As originally planned, the facility's construction was expected to begin in March 2001 and to be completed in 2005. However, a 2-year congressional freeze on funding postponed the start of construction until March 2003.

DOD's Defense Threat Reduction Agency (DTRA) manages the implementation of the CTR program. To construct the Shchuch'ye facility, DTRA—through the U.S. Army Corps of Engineers, the contract manager for the project—has contracted with Parsons, which in turn subcontracts the design and construction work to Russian contractors. Contracts are executed, managed, and reviewed in accordance with DOD and Federal Acquisition Regulations (FAR). Subcontractors submit bids in response to Requests for Proposal (RFP) issued by Parsons. Parsons then awards the subcontract on the basis of safety records, past performance, quality of work, price, and other factors. After awarding these contracts, Parsons works with the subcontractors to conduct technical evaluations of the schedule and cost of the work. CTR assistance will finance the construction of all buildings and structures on site, except for one. The Russian Federation has agreed to fund the construction of a second destruction building (Building 101A) nearly identical to Building 101, the U.S. funded destruction structure. Russia is also funding the construction of utilities (gas, electricity, water) needed to operate the facility and to support the local community.

Since 1992, Congress has passed 27 laws addressing the CTR program.<sup>3</sup> The legislation includes various DOD requirements for CTR funding, conditions on CTR expenditures, and mandates to report on the implementation of the CTR program. Some legislative provisions apply to the entire CTR program; others are directed at the Shchuch'ye project, including a requirement for a presidential certification that the project is in the U.S. national security interest.<sup>4</sup> The President's certification authority and the waiver of a prior prohibition on funding chemical weapons

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<sup>3</sup>For a summary of the legislation, see appendix II of GAO, *Cooperative Threat Reduction: DOD Has Improved Its Management and Internal Controls, but Challenges Remain*, [GAO-05-329](#) (Washington, D.C.: June 30, 2005). Since publication of that report, Congress has passed two laws containing measures addressing CTR. Pub. L. 109-103, Div A (The National Defense Authorization Act for Fiscal Year 2006) and Pub. L. 139-148, Div A (The Department of Defense Appropriations Act of 2006).

<sup>4</sup>Pub. L. 108-375, sec. 1303 (amending Pub. L. 108-136, sec. 1306).

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destruction in Russia expire on December 31, 2006.<sup>5</sup> In addition, Congress has conditioned funding for the Shchuch'ye facility on the Secretary of Defense's certification that, among other conditions, Russia has allocated at least \$25 million to eliminating its chemical weapons and has developed a practical plan for destroying its chemical weapons stockpile.<sup>6</sup>

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## Construction Has Progressed, but Project Is behind Schedule and Faces Substantial Challenges

Since our last visit to the Shchuch'ye site in 2003, we found that Parsons and DOD had made progress in constructing the facility. Several support buildings such as the fire station, worker housing, and warehouse had been completed; and many of the other structures, including the administration/cafeteria building, the processing building, and storage buildings were well under construction. However, key buildings had fallen behind schedule, affecting the facility's overall cost and schedule. Uncertain progress of Russian construction at the facility and on its infrastructure, an unpredictable Russian operating environment, and assorted technical issues could continue to impact the project's cost and schedule. Furthermore, the failure of Parsons to develop and implement a usable EVM system has limited DOD's efforts to oversee project schedule and cost.

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## DOD Has Made Progress but Is Experiencing Delays

During our visit to the Shchuch'ye site in November 2005, we observed substantial construction progress compared with our visit in November 2003. In 2003, the site consisted mainly of concrete foundations for the destruction buildings, with only the specialist camp<sup>7</sup> and warehouse under construction. By 2005, however, the support structures of many buildings had been built, and several buildings were at or near completion, including

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<sup>5</sup>See Pub. L. 106-65, sec. 1305.

<sup>6</sup>See Pub. L. 107-107, sec. 1308. The Secretary of Defense must certify that there has been (1) information provided by Russia, that the United States assesses to be full and accurate, regarding the size of the chemical weapons stockpile of Russia; (2) a demonstrated annual commitment by Russia to allocate at least \$25 million to chemical weapons elimination; (3) development by Russia of a practical plan for destroying its stockpile of nerve agents; (4) enactment of a law by Russia that provides for the elimination of all nerve agents at a single site; (5) an agreement by Russia to destroy or convert its chemical weapons production facilities at Volgograd and Novocheboksarsk; and (6) a demonstrated commitment from the international community to fund and build infrastructure needed to support and operate the facility.

<sup>7</sup>The specialist camp is the building to house contractors working on site.

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the specialist camp, warehouse, gas rescue station,<sup>8</sup> and fire station. (Fig. 2 shows the completed fire station.)

**Figure 2: Completed Firehouse at Shchuch'ye, November 2005**



Source: GAO.

Also under construction were the boiler house and the administration/cafeteria building, seen in figure 3.

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<sup>8</sup>The gas rescue station will serve as a training center and equipment depot for dealing with hazardous materials on site.

**Figure 3: Administration/Cafeteria Building under Construction, November 2005**



Source: GAO.

The concrete outer shells of Building 101 and the administration/control building had been completed. While Building 101 was still open to the elements and contained no inner walls, Russian subcontractors were installing outlets and control panels inside the drywall of the administration building. (See fig. 4 for a comparison of the construction work completed on Building 101 in November 2003 and November 2005.) We also observed piping and wiring being installed above ground for site wide electrical, heat, and water utilities.

**Figure 4: Construction Progress on Building 101 in November 2003 (left) and November 2005 (right)**

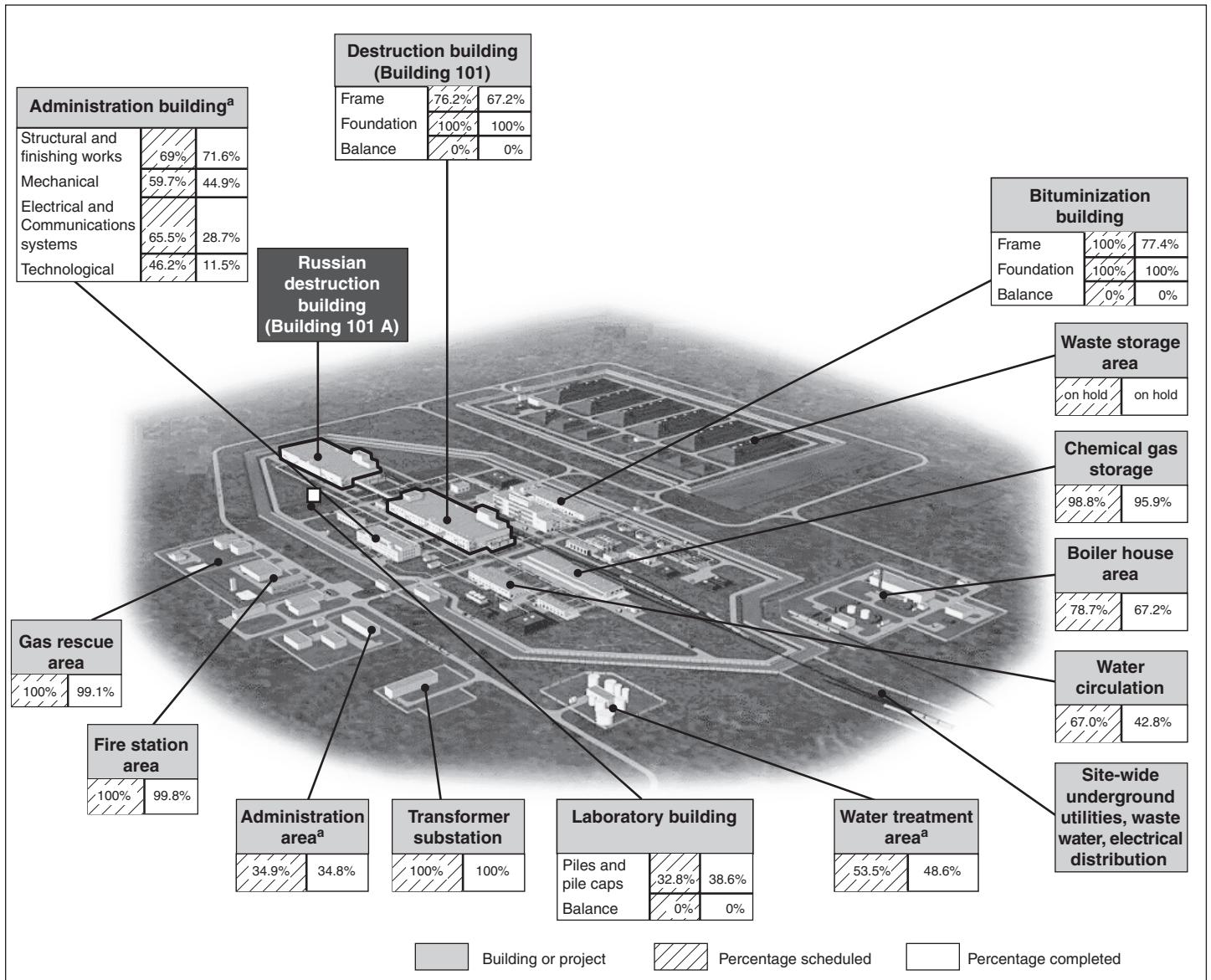


Source: GAO.

Despite such progress, the CWDF project has not met scheduled milestones, primarily because of a delay in awarding the contract for the completion of the CTR-funded destruction building (Building 101), pictured in figure 4. In January 2005, DOD estimated that the CWDF would cost \$1.039 billion and be transferred to the Russian Federation by July 2009. However, in March 2006, DOD officials stated that they were unable to estimate when the entire facility will be completed and at what cost until they award a contract for the completion of Building 101. As of February 2006, DOD estimated that the construction of the entire CWDF was about 40 percent complete, compared with the more than 52 percent scheduled for completion at that time. As indicated in figure 5, the construction of certain key structures is behind schedule, including the destruction building (Building 101), the control building (administration building), the boiler house, and the water circulation building.



**Figure 5: U.S. Construction Status of Key Structures at Shchuch'ye, March 2006**



Source: DOD.

<sup>a</sup>Building schedule modified by Parsons to reflect longer timelines.

Building 101 is on the “critical path”, that is, delays in finishing the building will prolong construction on other parts of the Shchuch'ye facility. Although the exterior shell of Building 101 is on schedule, the award of the construction contract for the remainder of Building 101 is behind

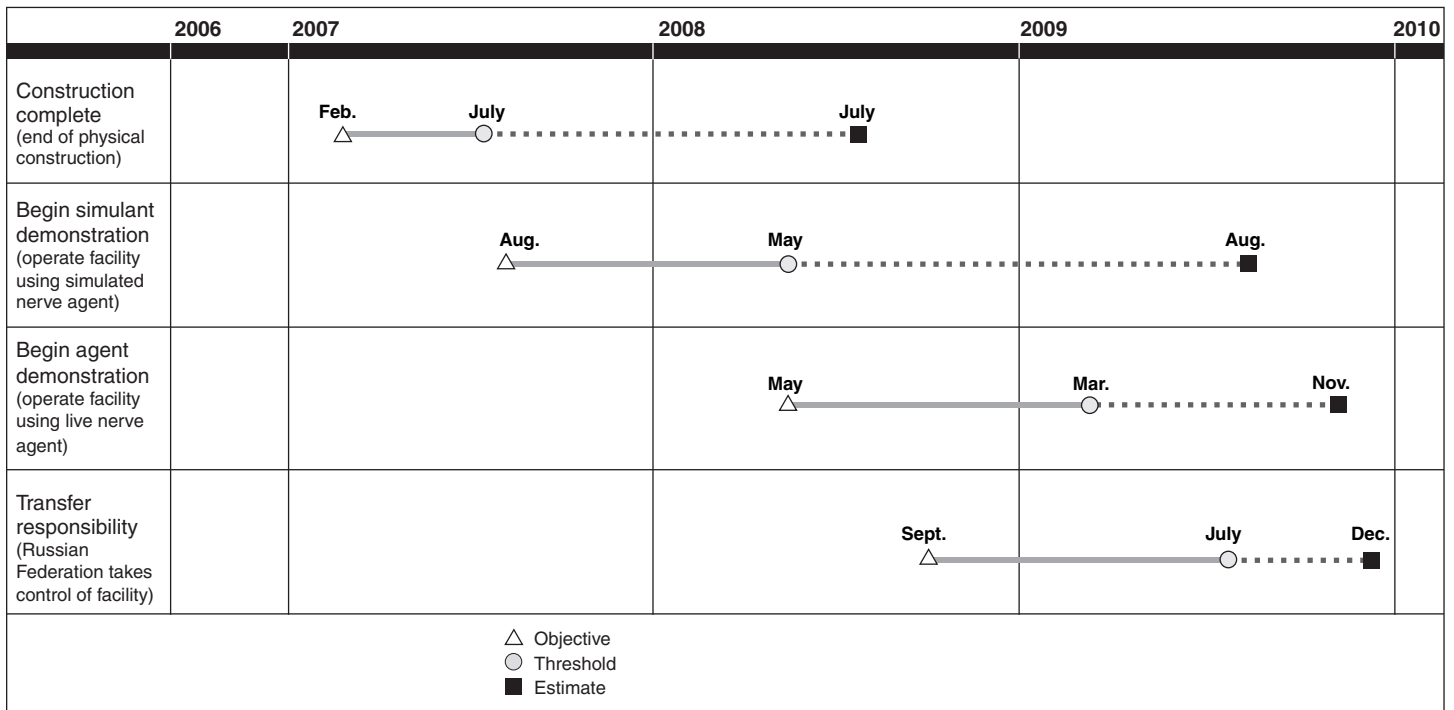
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schedule. Parsons had planned to award the subcontract for the balance of the building in June 2005, but it may not be awarded until summer 2006. Since October 2005, Parsons has incurred costs for personnel salaries, rent, and transportation of more than \$3 million per month, which will continue until the subcontract is awarded. Where possible, Parsons has reduced or delayed recruitment of personnel planned for management of Building 101. Construction activity is still ongoing at other buildings throughout the site.

The delay in awarding the contract for the remainder of Building 101 has impacted the overall schedule for completing the facility's construction. As part of its program management, DOD estimates dates for key project milestones at Shchuch'ye. These include a milestone schedule with objective (ideal) completion dates, threshold (latest acceptable) dates, and estimated completion dates for key activities. As of May 2006, however, DOD does not expect to meet key milestone dates for the CWDF. According to this schedule (as shown in fig. 6), construction of the facility will be delayed by about 1 year, testing using simulated nerve agent will begin some 15 months later than planned, and live agent demonstration will be delayed by about 8 months. While DOD estimates that it will turn over the Shchuch'ye facility to the Russian government in December 2009, such an estimate appears optimistic given the construction and other unknown delays that DOD may encounter in testing the facility with simulated and live nerve agent. DOD officials stated that these milestones may slip even further.



**Figure 6: Status of Key CWDF Milestones, as of May 2006**



Source: DOD.

### Shchuch'ye CWDF Delayed Due to Difficulties Working with Russian Subcontractors

The delays in constructing key buildings at the CWDF result from problems Parsons and DOD have had with Russian subcontractors, including the bankruptcy of one major subcontractor, problems in soliciting adequate bids, and difficulty maintaining a competitive-bidding process.

First, the 2005 bankruptcy of the Russian construction subcontractor Magnitostroy delayed construction of key buildings. This company was cited during the initial source selection process during 2000 to 2001 for its technical abilities, logistical capability, competitive pricing, and financial responsibility and was the first construction subcontractor to work on the Shchuch'ye project. According to DOD and Parsons officials, Magnitostroy enjoyed the strong support of the Russian government. However, it was discovered in 2005 that a senior executive embezzled millions of dollars from the company in 2003. As a result, the company was unable to afford sufficient labor to complete its work at the site, according to DOD and Parsons officials. The most serious delay involved the construction of the administration building—the command building that will control the

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destruction process. Although scheduled to be complete at the time of our visit in November 2005, construction of the administration building was only about 36 percent complete. By January 2006, Parsons had assumed direct responsibility for the construction of the building and had divided most of the remaining work among Magnitostroy's subcontractors. Similarly at that time, two other Magnitostroy buildings were behind schedule, requiring Parsons to extend their completion dates. Given these delays, Parsons has not provided Magnitostroy with RFPs on any new construction packages.

Second, DOD and Parsons officials stated that Russian subcontractors had not provided detailed cost and scheduling information in their bids. Although Parsons cited incomplete bids as the cause of the delay, DOD criticized Parsons for a "lack of urgency" in resolving the Building 101 bid issue. Parsons had particular difficulty soliciting adequate bids on the construction package for the work remaining on Building 101.<sup>9</sup> This construction package will complete the building's physical structure and install the equipment and processing systems needed to destroy the chemical munitions. According to DOD and Parsons officials, it is the largest, most complex construction package of the CWDF project. After Magnitostroy's bankruptcy, two other contractors, Spetzstroy and Stroytransgaz, bid on the remaining Building 101 construction package. According to DOD officials, their bids arrived after the June 2005 deadline and did not include adequate cost and schedule data. Despite a deadline extension, neither subcontractor submitted a complete bid until the end of December 2005. At that time, only Spetzstroy submitted a responsive bid. Its bid price, however, was \$239 million over DOD's budget.

Third, the small pool of approved Russian subcontractors has made it difficult to maintain a competitive-bidding process. According to DOD, the subcontractors for the CWDF are selected through a series of joint selection committees. The Russian government develops a list of approved companies that Parsons and a joint commission comprising DOD and Russian government officials examine. In the initial round of subcontractor selections in 2000 to 2001, Magnitostroy was the first CWDF subcontractor chosen. A second round of selections in 2003 added four more subcontractors: Promstroy, Spetzstroy, Stroyprogress, and Stroytransgaz. According to DOD officials, before Magnitostroy's 2005

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<sup>9</sup>Construction packages are "mini contracts" for completing specific tasks associated with buildings and infrastructure that are awarded to subcontractors on a competitive basis.

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bankruptcy, Magnitostroy, Stroytransgaz, and Spetzstroy were the only subcontractors that were capable of completing larger construction efforts. The small number of Russian contractors discouraged effective competition and limited the number of construction packages that could be awarded.

In March 2005, DOD requested that the Russian Federation expand the subcontractor pool to ensure completion of the Shchuch'ye facility on time and within budget. The Russian government added one small specialty subcontractor, Vneshstrojimport, but did not restart the selection process to find a replacement for Magnitostroy. In December 2005, Stroytransgaz withdrew from competition, and the sole remaining contractor, Spetzstroy, submitted a bid for \$310 million to complete Building 101. However, DOD had budgeted only \$71 million for the construction package. To reconcile the cost difference, DOD paid for an independent cost analysis that validated the original Parsons estimate of \$56 million. Parsons and DOD also sought the assistance of the Russian government to negotiate with Spetzstroy to lower its bid. When negotiations failed to produce a compromise, Parsons canceled the RFP for the balance of Building 101 on March 2, 2006.

In March 2006, DOD resubmitted a request for more subcontractors and provided the Russian government with a list of five potential companies, three of which were added to the pool. In April 2006, Parsons issued a new RFP for the remainder of Building 101. According to DOD officials, Parsons has and will continue to conduct weekly meetings with the bidders and make personnel available for questions and clarifications regarding the RFP.

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### Cost and Schedule Subject to Uncertain Progress of Russian Construction, an Unpredictable Russian Operating Environment, and System Testing Issues

The cost and schedule of the Shchuch'ye facility are subject to continuous risks. The Russian Federation's uncertain progress in completing work on Building 101A and required utilities could delay the final system testing for the CWDF. The Russian government's failure to complete promised social infrastructure could generate local opposition to the CWDF. DOD and Parsons must also operate in an unpredictable Russian environment with changing legal and technical requirements that could directly affect schedule and cost.

### Uncertain Russian Progress in Completing Facility and Infrastructure

Russian Federation progress in completing Building 101A, as well as the industrial and social infrastructure surrounding the CWDF, remains uncertain. According to DOD officials, the Russian government's method of construction scheduling contains few itemized tasks, making it difficult

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to accurately gauge construction progress and uncover issues that could cause delays. Although DOD and Parsons monitor Russian Federation construction progress through monthly progress reports and project site visits, the Russian government has not always followed jointly agreed upon schedules. DOD and Parsons officials remain concerned that systemization timelines could be affected if both destruction buildings are not completed at the same time. Furthermore, Russian progress in constructing utilities for the CWDF and the local community has produced mixed results. For instance, we observed that the Russian government has installed only one of three power lines needed to operate the CWDF. According to Parsons and DOD officials, although the Russian government completed the new water line to the CWDF and the town of Shchuch'ye in 2004, the more water the CWDF uses, the less the town has available. This may lead to a competition for water when the facility begins consuming substantially more water when testing of the facility's systems begins, and during operation. Furthermore, when the Russian government constructed a new gas line to the CWDF and through the town of Shchuch'ye, it did not connect the line to local homes as promised. A local Shchuch'ye official stated that most local residents cannot afford to pay for connection to the main gas line and expressed concerns that the Russian government will not fulfill its obligations to the local population. To allay public concerns that may impact the CWDF, DOD uses public outreach offices to conduct opinion polls and educate the local populace on the CWDF.<sup>10</sup>

## Russia's Operating Environment Is Unpredictable

DOD and Parsons must contend with an unpredictable Russian business environment that can affect cost and schedule through unexpected changes in Russian legal, technical, and administrative requirements.<sup>11</sup> New regulatory requirements have impacted the CWDF; in one case, stopping work on a building until it could be redesigned to comply with new Russian electrical codes. In November 2005, a new Russian regulatory agency—the Federal Service for Ecological, Technological and Nuclear Oversight (Rostekhnadzor)—performed a surprise audit at the Shchuch'ye CWDF. The agency cited Parsons with noncompliance in several areas, including environmental and industrial safety reviews, permits, licenses, and certifications. While Parsons and DOD officials were not aware of these requirements, they agreed to implement corrective

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<sup>10</sup>The public outreach offices are located in Shchuch'ye, Chelyabinsk, and Kurgan.

<sup>11</sup>According to its agreement with DOD, the Russian government must identify and obtain all legal permits, licenses, and certifications required to design, construct, equip, commission, and operate the Shchuch'ye CWDF.

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actions. As of March 2006, Parsons had resolved 82 percent of the Rostekhnadzor audit findings and was working to mitigate the remainder. DOD continues to negotiate with Rostekhnadzor to meet the requirements of Russian law and is working with the Russian government to identify feasible solutions. Additionally, Parsons has contracted with consultants that specialize in helping companies conform to Russian fire, ecological, and industrial safety regulations at the local and national levels.

Furthermore, DOD and Parsons must review new technical requirements raised by Russian government officials. According to DOD officials, some new requirement requests are justified as they relate to the operation of the CWDF, while most others are attempts to transfer cost and risk from Russia to the United States. For example, as a result of code and space deficiencies, DOD accepted the Russian requirement for an additional laboratory building on site, construction of which will increase the project's cost by an additional \$12 million. However, DOD officials have resisted approving Russian requests that they believe are unnecessary or that fall within Russian responsibilities at the site. DOD refused to allow the Russian government to incorporate a new machine into the destruction process, which would have required significant redesign and testing of the process, and led to schedule delays and increased project costs.

Russian requirements for long-term visas and value added tax (VAT) exemptions for equipment have affected cost and schedule. The Russian government provides most DOD and Parsons personnel with only 6-month visas, requiring workers to temporarily leave the country while their visas are reissued. One DOD official estimated that transportation costs associated with this practice totaled approximately \$3 million as of November 2005. However, DOD officials have noticed improvement in how quickly the Russian Federation processes visas. In addition, when the Russian government reorganized in early 2004, the office in charge of Russian customs was dissolved, leaving no agency able to approve the VAT exemptions for more than 6 months. During that time, all equipment shipped from the United States was halted, causing a 3-month slip in the CWDF construction schedule. In late 2004, the Russian Federation eventually reestablished a new VAT office, and equipment delivery was resumed. Since that time, DOD has encountered no VAT-related delays.

### Testing Issues Could Delay Destruction Process

Issues associated with the testing of the CWDF's utilities and automated destruction system (systemization) could further delay the schedule and increase costs. DOD officials identified systemization of the CWDF as the next major challenge after resolving the bid issue for Building 101.

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Systemization consists of a series of tests to ensure the safety, function, and interoperability of the CWDF internal systems—i.e., water, gas, electric, heat, and the chemical munitions destruction process. Such testing could be delayed if either destruction building (101 or 101A) or essential utilities are not completed on time. The automated destruction process is complex, involving the drilling, draining, and decontamination of various sizes and types of munitions, and the neutralization of the nerve agent they contain. Ensuring that this system works and interfaces properly with the rest of the facility will require the testing and calibrating of roughly 1,000 different processes, according to a DOD official. DOD officials noted that U.S. experiences with destroying chemical weapons found that systemization often encounters difficulties and delays and has the potential to increase costs. Furthermore, DOD and Parsons must compete the systemization contract between two Russian subcontractors, Redkino and Giprosintez, selected by the Russian government. Given previous difficulties working with subcontractors, Parsons may experience delays in obtaining adequate and reasonably priced bids.

DOD is attempting to mitigate systemization risk by exploring options to test the CWDF's systems using Russian rather than U.S. methods. Although the Shchuch'ye facility is a Russian design, it is currently planned to undergo testing procedures similar to those DOD uses in the United States. According to DOD officials, Russian systemization methods are less involved than U.S. processes, which must adhere to stringent environmental and operating regulations and can take 16 to 18 months to complete. The Russian government, however, systemized its CWDF at Kambarka within 6 to 9 months. While DOD officials caution that each CWDF is unique, given the types of munitions to be destroyed, they have begun exploring whether Russian methods may allow for streamlining and compression of the systemization schedule at Shchuch'ye, while still maintaining acceptable safety levels. Parsons and its subcontractors are also testing the automated destruction system equipment before it is installed in Building 101.

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## EVM System Has Not Been Effectively Implemented and Contains Flawed Data

DOD policy and guidance<sup>12</sup> require the use of EVM to measure program performance. EVM uses contractor reported data to provide program managers and others with timely information on a contractor's ability to perform work within estimated cost and schedule. It does so by examining variances reported in contractor performance reports between actual cost and time of performing work tasks and the budgeted or estimated cost and time. In September 2004, DOD modified its contract with Parsons, allocating about \$6.7 million and requiring the company to apply EVM to the Shchuch'ye project. Parsons was expected to have a validated EVM system by March 2005.<sup>13</sup> As of April 2006, Parsons had not developed an EVM system that provided useful and accurate data to CWDF program managers. In addition, our analysis found that the project's EVM data are unreliable and inaccurate. According to DOD officials, these problems stem in part from Parsons' outdated accounting system. EVM guidance states that surveillance<sup>14</sup> of an EVM system should occur over the life of the contract. DOD has not yet conducted an IBR<sup>15</sup> for the Shchuch'ye project and does not plan to do so until after Parsons awards the subcontract to complete Building 101, possibly in June 2006.

## Parsons' EVM System Is Not Yet Useful to DOD Managers

In December 2005 a Parsons' self-evaluation<sup>16</sup> stated that the EVM system for the CWDF was "fully implemented." In contrast, DOD characterized Parsons' EVM implementation as a "management failure," citing a lack of experienced and qualified Parsons staff. DOD withheld approximately

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<sup>12</sup>Defense Contract Management Agency, *Department of Defense Earned Value Management Implementation Guide*, (Washington, D.C.: Apr. 7, 2005). See also DOD Memorandum: *Revision to DOD Earned Value Management Policy*, (Washington, D.C.: Mar. 7, 2005).

<sup>13</sup>According to DOD, a validated EVM system was not required at the time the Parsons contract was awarded. A modified EVM system, implemented in September 1998, was maintained and used until December 2004.

<sup>14</sup>Surveillance is the process of reviewing the health of the EVM system process. The purpose of surveillance is to focus on using an EVM system effectively to manage cost, schedule, and technical performance. An effective surveillance process ensures that the key elements of the process are maintained over time.

<sup>15</sup>An IBR verifies the technical content of the baseline. It also ensures that contractor personnel understand and have been adequately trained to collect EVM data. The review also verifies the accuracy of the related budget and schedule to ensure that risks have been properly identified, and it also assesses whether the contractor meets the program's objectives.

<sup>16</sup>Award fee contracts allow government agencies to adjust the amount of fee paid to contractors based on the contractor's performance. Parsons is required to do a self assessment of its performance at the end of each award fee evaluation period.

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\$162,000 of Parsons' award fee due to concerns over the EVM system. In March 2006, DOD officials stated that at that point in implementation, EVM was not yet a usable tool in managing the Shchuch'ye project. DOD officials stated that Parsons needs to demonstrate that it incorporates EVM into project management rather than simply fulfilling a contractual requirement. DOD expects Parsons to use EVM to estimate cost and schedule impacts and their causes and, most importantly, to help eliminate or mitigate identified risks.

Parsons' EVM staff stated that they underestimated the effort needed to incorporate EVM data into the system, train staff, and develop EVM procedures. Parsons officials were also surprised by the number of man-hours required to accomplish these tasks, citing a high level of staff turnover as contributing to the problem. According to the officials, working in a remote and isolated area caused many of the non-Russian employees to leave the program rather than extend beyond their initial tour of duty.

#### Parsons' EVM Data Are Inaccurate and Unreliable

Based on our review of Parsons' monthly EVM data for September 2005 through January 2006, we found that the data are inaccurate and unreliable and that Parsons is exercising poor quality control over its EVM data. Specifically, we discovered numerous instances where data were not added properly for scheduled work; Parsons' EVM reports, therefore, did not accurately capture data needed by project management to make informed decisions about the Shchuch'ye facility. For example, we found that from September 2005 through January 2006, Parsons' EVM reports contained addition errors that did not capture almost \$29 million in actual costs for the CWDF project. Such cost omissions and other errors may cause DOD and Parsons project officials to overestimate the amount of project funding available.

Moreover, we found several instances where the accounting data were not allocated to the correct cost accounts, causing large cost over-runs and under-runs. This problem occurred because the accounting data were placed in the wrong account or Parsons' accounting system was unable to track costs at all levels of detail within EVM. A Parsons official stated that the company was taking measures to identify these inaccuracies and allocate the accounting data to the proper cost accounts. These problems, however, have led to numerous accounting errors in the EVM reports. Such mistakes underestimate the true cost of the CWDF project by ignoring cost variances that have already occurred. Cost variances compare the earned value of the completed work with the actual cost of the work performed. Until Parsons fixes its accounting system, manual



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adjustments will have to be made monthly to ensure that costs are properly aligned with the correct budget. Such continuous adjustments mean that the system is consistently reflecting an inaccurate status of the project for Parsons and DOD managers. (For specific examples of our findings regarding Parsons' EVM data, see app. II.)

EVM guidance states that surveillance of an EVM system should occur over the life of the contract to guarantee the validity of the performance data provided to the U.S. government. Initial surveillance activities involve performing an IBR of a project within 6 months of awarding a contract and as needed throughout the life of a project. DOD and Parsons have not yet conducted an IBR for the Shchuch'ye project. Program managers are expected to use EVM reports that have been validated by an IBR. Without verifying the baseline, monthly EVM reporting, which tracks project work against a set budget and schedule, is neither meaningful nor valid. Parsons and DOD officials explained that while an IBR has been discussed, one will not be conducted until Parsons awards a contract for completing Building 101. DOD officials estimate that the award process for this contract may not be completed until summer 2006, approximately a year later than planned. According to Parsons, as of January 2006, about \$66 million of scheduled work has not been completed as planned, due to the delay in awarding the subcontract for the balance of Building 101. DOD officials stated that while they recognize the importance of conducting surveillance over an EVM system, they currently are focused on the immediate need of establishing a usable EVM system on which to perform surveillance.

Furthermore, DOD requires all EVM systems to undergo a compliance audit or "validation" conducted by the Defense Contract Management Agency (DCMA) with assistance from the Defense Contract Audit Agency (DCAA). DCAA found that Parsons' accounting process was inadequate. A DCAA official on the validation team stated that Parsons is relying on an outdated accounting system that has difficulty capturing actual costs for the Shchuch'ye project and placing them into appropriate cost categories. The DCAA official stated that Parsons management should have discovered such accounting errors before the EVM report was released to DOD. DCAA therefore questioned whether Parsons can generate correct accounting data and recommended that Parsons update its accounting system. As of April 2006, DCMA and DCAA had not yet validated Parsons' EVM system. (For more information regarding DCMA and DCAA's assessments of Parsons' EVM system see app. II.)

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## Russia Has Developed a Destruction Plan and Increased Funding but May Not Meet Its Destruction Deadlines

Since our report in March 2004,<sup>17</sup> the Russian government has approved a plan to destroy its chemical weapons stockpile and has begun financing significantly more of its own destruction activities. However, as of April 2006, the Russian government's progress in destroying its chemical weapons stockpile has been limited, and the Russian government's destruction plan may be overly ambitious and reliant on international assistance.

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## Russia Has Developed a Destruction Plan That May Prove Overly Ambitious

We reported in early 2004 that Russia's lack of a credible chemical weapons destruction (CWD) plan had hindered destruction activities. However, in October 2005, the Russian government approved a plan for destroying its entire chemical weapons stockpile by the CWC-established deadline of 2012.<sup>18</sup> The October 2005 plan calls for using seven destruction facilities to eliminate the entire chemical weapons stockpile. Destruction of the chemical weapons stockpile at Gorniy was completed in December 2005. As of March 2006, only the facility at Kambarka is operational. The plan outlines the construction of the remaining five sites, including Shchuch'ye, where nerve agent is to be eliminated.

According to the Russian plan, the blister agents stored at Gorniy and Kambarka were to be destroyed first. In December 2005, the Russian government completed its destruction efforts at Gorniy and began destroying chemical weapons at Kambarka. In accordance with the plan, destruction will next be focused on nerve agents. The storage sites near Leonidovka, Maradykovskiy, and Pochep house large nerve-agent munitions, while those near Shchuch'ye and Kizner store smaller munitions. Table 1 depicts the schedule for Russian chemical weapons destruction facilities.

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<sup>17</sup>GAO, *Nonproliferation: Delays in Implementing the Chemical Weapons Convention Raise Concerns About Proliferation*, [GAO-04-361](#) (Washington, D.C.: Mar. 31, 2004).

<sup>18</sup>The Government of the Russian Federation Resolution, No. 639 (Oct. 24, 2005). On Amendments to the Federal Target-Oriented Program, "Chemical Weapons Stockpiles Destruction in the Russian Federation."

**Table 1: Schedule for Russian CWDFs**

Russian destruction facility site	Actual or estimated date of operation	Actual or estimated completion date for destroying weapons	Type of chemical weapons	Quantity of agent to be destroyed (metric tons)	Amount of declared stockpile (metric tons)
Gorniy	December 2002	December 2005	Bulk blister	0	1,120
Kambarka	December 2005	2010	Bulk blister	6,347	6,360
Maradykovskiy	2006	2012	Large nerve munitions	6,960	6,960
Shchuch'ye	2008	2012	Small nerve munitions	5,440	5,440
Leonidovka	2008	2012	Large nerve munitions	6,960	6,960
Pochep	2008	2012	Large nerve munitions	7,520	7,520
Kizner	2009	2012	Small nerve munitions	5,640	5,640

Sources: GAO analysis of Russian government and DOD data.

While the Russian plan indicates that the CWDF at Shchuch'ye will be operational by 2008, DOD estimates that the facility may not be operational until 2009. Furthermore, the Russian government's priority is to destroy nerve agents contained in large munitions, because destroying the larger-sized munitions first would allow Russia to meet its CWC destruction deadlines faster. Accordingly, the destruction of smaller munitions at Shchuch'ye<sup>19</sup> may become less of a priority for the Russian government.

However, the Russian government's destruction plan to eliminate all chemical weapons by 2012 may be unrealistic. It depends on the construction of seven facilities, but only two have been built, two are under construction, and three have not been started. Although the CWDF at Maradykovskiy may be operational in mid-2006, the Shchuch'ye facility is still under construction, and only minimal work has begun at the three remaining sites of Kizner, Leonidovka, and Pochep. According to its CWC destruction schedule, Russia must eliminate 20 percent of its chemical weapons stockpile by April 2007. As of March 2006, it had eliminated about 3 percent at Gorniy and Kambarka. Between April 2007 and April

<sup>19</sup>The nerve agents to be destroyed at the Shchuch'ye CWDF are stored at the Planovy arsenal located about 10 miles away.

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2012, Russia must eliminate the remainder of its chemical weapons stockpile (about 80 percent) at five destruction facilities that have yet to be completed. It will be extremely difficult for the Russian government to complete and operate the last three facilities by its proposed schedule and meet its CWC commitment to destroy all stockpiles at these sites by the extended deadline of April 2012.

Similarly, as of April 2006, DOD announced that the United States will not be able to meet the CWC extended destruction deadline of 2012. DOD estimates indicate that about 66 percent of the U.S. declared chemical weapons stockpile will be destroyed by April 2012. As of March 2006, the United States had destroyed about 36 percent of its declared stockpile. In the United States, DOD had five operating chemical weapons destruction facilities as of March 2006, and two additional facilities were being designed.<sup>20</sup>

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### Russia Has Significantly Increased Funding, but Destruction Efforts Need International Assistance

According to the Russian destruction plan, the estimated cost for eliminating the entire Russian chemical weapons stockpile is more than 160 billion rubles—about \$5.6 billion.

Over the past 6 years, Russia has substantially increased its annual funding for its chemical weapons destruction efforts. In 2000, the Russian government spent about \$16 million for chemical weapons destruction. By 2005, it had spent almost \$400 million. For 2006, the Russian government plans to spend more than \$640 million. For chemical weapons elimination at Shchuch'ye, the Russian government has budgeted about \$144 million since fiscal year 2000. Russian funding at the site supports construction of one of the two destruction buildings (Building 101A), as well as the industrial and social infrastructure (utilities, roads, schools, etc.) needed to support the facility's operations.

The Russian government will need continued international assistance to complete destruction of its chemical weapons stockpile. The United States, Canada, Germany, Italy, United Kingdom, and other donors have committed almost \$2 billion in assistance, with the United States

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<sup>20</sup>The U.S. facilities operational as of March 2006 include Umatilla, Ore.; Newport, Ind.; Deseret, Utah; Pine Bluff, Ark.; and Anniston, Ala. The facilities at Blue Grass, Ky.; and Pueblo, Colo., remain in the design phase. In February 2006, the facility at Edgewood, Md., began closing procedures. As of November 2003, all chemical weapons at Johnston Atoll were destroyed and the destruction facility dismantled.

committing the largest amount, about \$1.039 billion. The Russian government estimates it will need about \$5.6 billion to eliminate its entire stockpile. All U.S. assistance for destroying Russian chemical weapons is being provided to the CWDF at Shchuch'ye.<sup>21</sup> As of March 2006, other international donors, such as Canada and the United Kingdom, are also providing significant assistance to Shchuch'ye to help fund the Russian destruction building (Building 101A) and the infrastructure needed to support the facility's operation.<sup>22</sup> Although Italy is providing some funding for Shchuch'ye infrastructure, most of its contributions are committed to the construction of the CWDF at Pochep. Russia has been relying on German assistance to destroy its stockpile of blister agents at the Gorniy and Kambarka destruction facilities. Table 2 describes the commitments and types of assistance provided by international donors.

**Table 2: International Assistance for Russian Destruction, as of April 2006**

<b>International donors</b>	<b>Committed funding for Russian destruction (U.S. dollars)<sup>a</sup></b>	<b>Areas to receive international assistance</b>	<b>Types of projects being funded</b>
Belgium	\$100,000	Shchuch'ye	To be determined
Canada	89,150,537	Shchuch'ye	Industrial infrastructure, railway, and equipment for Building 101A
Czech Republic	232,458	Shchuch'ye	Industrial infrastructure (electrical substations)
Denmark	117,970	Various locations	Public outreach efforts
European Union	14,156,452	Gorniy, Kambarka, and Shchuch'ye	Equipment at Gorniy and Kambarka, and industrial infrastructure at Shchuch'ye (electrical substation)
Finland	871,771	Gorniy and other locations	Equipment at Gorniy and public outreach efforts
France	7,077,976	Shchuch'ye	Environmental surveys and other projects to be determined
Germany	233,573,198	Gorniy and Kambarka	Equipment for the construction and operation of both facilities
Ireland	94,376	Shchuch'ye	To be determined
Italy	439,660,257	Shchuch'ye and Pochep	Infrastructure (gas pipeline) at Shchuch'ye and the construction of the Pochep CWDF
Netherlands	9,028,325	Shchuch'ye	Equipment for Building 101A

<sup>21</sup>In addition to funds for destroying Russian chemical weapons, other CTR assistance is being provided to help eliminate former Russian chemical weapons production facilities at Volgograd and Novocheboksarsk.

<sup>22</sup>The United States, the United Kingdom, and Canada, in conjunction with the Russian Federation, formed a working group in November 2003 to coordinate all international assistance to the Shchuch'ye site.

<b>International donors</b>	<b>Committed funding for Russian destruction (U.S. dollars)<sup>a</sup></b>	<b>Areas to receive international assistance</b>	<b>Types of projects being funded</b>
New Zealand	1,158,433	Shchuch'ye	Industrial infrastructure (electrical substation)
Norway	3,250,969	Shchuch'ye	Industrial Infrastructure (electrical substation) and other projects to be determined
Nuclear Threat Initiative	1,000,000	Shchuch'ye	Infrastructure (railway bridge)
Sweden	952,988	Shchuch'ye	To be determined
Switzerland	6,984,707	Kambarka, Shchuch'ye, and other locations	Sanitary and hygiene monitoring system at Shchuch'ye, equipment at Kambarka, and public outreach efforts
United Kingdom	141,196,728	Shchuch'ye and other locations	Industrial infrastructure, equipment for Building 101A, and public outreach efforts
United States	1,039,200,000	Shchuch'ye	Construction of the destruction facility
<b>Total</b>	<b>\$1,987,807,145</b>		

Sources: GAO analysis of data from DOD, State, and international donors.

<sup>a</sup>Donor commitments converted from foreign currencies to U.S. dollars using the annual 2005 exchange rate.

To facilitate additional international contributions, the Russian government has provided potential donors a list of CWDF projects requiring assistance. Primarily, assistance is needed for the construction of the destruction facilities at Kizner, Leonikovka, and Pochev, as well as related infrastructure support. The Russian government is also seeking international funding to support operations at the Kambarka and Maradykovskiy facilities.

## Conclusion

Until destroyed, Russia's stockpile of chemical weapons—especially nerve agents contained in small munitions, such as those stored at Shchuch'ye—remain a proliferation threat, vulnerable to diversion and theft. Since 1992, the United States has been providing CTR assistance for the CWDF at Shchuch'ye to help reduce the threats posed by these weapons. Originally designed as a pilot facility to “jump start” Russian chemical weapons destruction efforts, Shchuch'ye may no longer be a priority for the Russian government. Delays in implementing the Shchuch'ye project over the past 14 years led the Russian government to begin destruction efforts at other sites. Disagreements between the United States and Russia over the types of munitions to destroy and how to destroy them, negotiations to resolve outstanding issues, restrictions on U.S. funding, and difficulties with Russian subcontractors, among other factors, have delayed the Shchuch'ye facility's completion and increased its costs. Although progress has been made on the physical construction of the facility over

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the past 3 years, DOD continues to encounter numerous challenges that affect the completion of the Shchuch'ye CWDF. Furthermore, DOD currently cannot reliably estimate when the Shchuch'ye facility will be completed and at what cost. Parsons' EVM system, implemented to help manage the schedule and cost of the Shchuch'ye project, contains unreliable and inaccurate data; thus, DOD cannot use it as a management tool. Even with significant international assistance at Shchuch'ye and other destruction facility sites, the Russian government will likely fail to destroy its entire chemical weapons stockpile by the CWC extended deadline of 2012.

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## Recommendations for Executive Action

Unreliable EVM data limit DOD's efforts to accurately measure progress on the Shchuch'ye project and estimate its final completion date and cost. As such, we recommend that the Secretary of Defense direct DTRA, in conjunction with the U.S. Army Corps of Engineers, to take the following three actions:

- ensure that Parsons' EVM system contains valid, reliable data and that the system reflects actual cost and schedule conditions;
- withhold a portion of Parsons' award fee until the EVM system produces reliable data; and
- require Parsons to perform an IBR after awarding the contract for completing Building 101.

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## Agency Comments and Our Evaluation

DOD provided comments on a draft of this report, which are reproduced in appendix III. DOD concurred with our recommendation that DTRA in conjunction with the U.S. Army Corps of Engineers ensure that Parsons' EVM system contains valid, reliable data and reflects actual cost and schedule conditions, and require that Parsons perform an IBR after awarding the contract for completing Building 101. DOD partially concurred with our recommendation that a portion of Parsons' award fee be withheld until the EVM system produces reliable data. DOD stated that it had withheld a portion of Parson's award fee in a previous period. DOD further noted that an award fee must be based on the merits of the contractor's performance and until the performance period is completed, it cannot prejudge Parsons' performance and predetermine the withholding of award fees based on our recommendation. DOD also provided technical comments, which we have incorporated where

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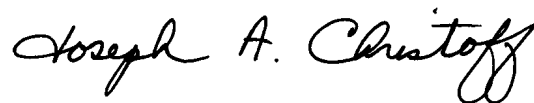
appropriate. The Department of State was provided a draft of this report but did not provide comments.

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We are providing copies of this report to the Secretaries of Defense and State and interested congressional committees. We will also make copies available to others upon request. In addition, this report will be available on the GAO Web site at <http://www.gao.gov>.

If you or your staff have any questions concerning this report, please contact me at (202) 512-8979 or [christoffj@gao.gov](mailto:christoffj@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix IV.

Sincerely yours,



Joseph A. Christoff  
Director, International Affairs and Trade



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# Appendix I: Scope and Methodology

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To assess the progress of the Shchuch'ye facility, we collected and analyzed Department of Defense (DOD) and Parsons Global Services, Inc. (Parsons) contractor documents and met with relevant officials. Specifically, we met with officials from the Cooperative Threat Reduction (CTR) Policy Office, the office of the Assistant to the Secretary of Defense for Nuclear and Chemical and Biological Defense Programs, the Defense Threat Reduction Agency (DTRA), and the U.S. Army Corps of Engineers. Within DTRA, we obtained information from the Director of the Cooperative Threat Reduction Directorate, as well as the program and project managers, for chemical weapons elimination. We also met with officials from the Threat Reduction Support Center in Springfield, Virginia. In addition, we met with officials from the DTRA office and the Chemical Weapons Destruction Support Office in Moscow.

We traveled to the Russian Federation to observe construction of the CTR-funded chemical weapons destruction facility at Shchuch'ye. At Shchuch'ye and Chelyabinsk, we met with personnel from Parsons and the U.S. Army Corps of Engineers. In Moscow, we met with Russian government officials at the Federal Agency for Industry, the Ministry of Foreign Affairs, the Duma, and the Accounts Chamber of the Russian Federation. We also analyzed the reliability of the earned value management (EVM) data for the Shchuch'ye project. Specifically, we examined Parsons' EVM reports for a 5-month period from, September 2005 to January 2006, to assess the Shchuch'ye destruction facility's cost and schedule. We checked the EVM data to see if there were any mathematical errors or inconsistencies that would lead to the data being unreliable. We interviewed officials from the Defense Contract Management Agency (DCMA), the Defense Contract Audit Agency (DCAA), and Parsons officials to better understand the anomalies in Parsons' EVM data and determine what outside surveillance was being done to ensure the validity of the EVM data. We also used a data collection instrument to obtain detailed information from DOD on the Shchuch'ye project, including the contract, program management activities, independent cost estimates, risk analysis, and award fees.

To obtain information on Russian elimination efforts and international donor assistance for Russian chemical weapons destruction, we met with U.S., Russian, and international donor officials and obtained copies of pertinent documents, including the Russian chemical weapons destruction plan. We obtained information from officials in the Bureau of European and Eurasian Affairs and the Bureau of International Security and Nonproliferation at the Department of State. At DOD, we met with officials and acquired documents from the Office of the Secretary of Defense for

Cooperative Threat Reduction Policy. In Moscow, we obtained information from Russian government officials at the Accounts Chamber, the Federal Agency for Industry, the Ministry of Foreign Affairs, and the Duma. At Shchuch'ye, we spoke with a local government official involved with public outreach efforts. We obtained data from the U.S., Russian, British, Canadian, and German governments as well as the G-8 Global Partnership on the assistance committed and provided for Russian chemical weapons destruction efforts. To assess the reliability of these data, we corroborated other nations' data wherever possible, comparing and cross-checking documents and information. We interviewed officials from the United States, Canada, Germany, the United Kingdom, and the Russian Federation. We determined that data on funding and assistance provided for Russian chemical weapons destruction were sufficiently reliable for the purposes of this report. We also determined that data on the status of Russian and U.S. chemical weapons elimination were sufficiently reliable for the purposes of this report.

The information on Russian law in this report does not reflect our independent legal analysis but is based on interviews and secondary sources. We performed our work from June 2005 through May 2006 in accordance with generally accepted government auditing standards.

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# Appendix II: Lack of Reliable EVM Data Limits DOD's Ability to Estimate Schedule and Cost for Constructing the CWDF

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Measuring and reporting progress against cost and schedule commitments is vital to effective program management. To measure program performance, DOD requires the use of EVM, a concept that has been used by DOD since the 1960s for measuring program performance. Through EVM, program offices can determine a contractor's ability to perform work within cost and schedule estimates by examining variances between the actual and estimated costs and time to perform work tasks. EVM offers many benefits when done properly and serves as a means to measure performance and identify deviations from planned activities, allowing program managers to mitigate risks. Based on our analysis of Parsons' EVM data, and the findings of DCMA and DCAA, the data are inaccurate and unreliable. Without reliable schedule and cost estimates, DTRA has limited means to accurately assess when the Shchuch'ye facility will be completed and at what cost.

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## GAO's Analysis Reveals Parsons' EVM Data are Unreliable and Require Surveillance

In reviewing Parsons' monthly EVM data for September 2005 through January 2006, we discovered numerous instances of data not adding properly for scheduled work. Further, Parsons' EVM reports are not capturing all of the data needed by project management to make informed decisions about the Shchuch'ye facility. Such errors may cause DOD and Parsons project officials to overestimate the amount of funding available to cover future risks, such as the systemization of the Shchuch'ye facility. Moreover, we found several instances where the accounting data were not allocated to the correct cost accounts causing large cost over-runs and under-runs. In these cases, the accounting data were placed in the wrong account, or Parsons' accounting system was unable to track costs at the level of detail EVM requires. Parsons officials stated that measures are being taken to identify these inaccuracies and allocate the accounting data to the proper cost accounts. These problems, however, have led to numerous accounting errors in Parsons' EVM reports.

Furthermore, in reviewing Parsons' EVM reporting data, we found several errors that a Parsons' official attributes to the company's accounting system. For instance, current EVM period data are not accurate due to historical data corruption, numerous mistakes in accounting accruals, and manual budget adjustments. Such mistakes underestimate the true cost of the CWDF project by ignoring cost variances that have already occurred. For example, the Moscow project management task was budgeted at a cost of \$100,000. According to the January 2006 EVM report, the work has been completed but the actual cost was \$2.6 million, resulting in an overrun of approximately \$2.5 million. The EVM report, however, fails to capture the expected \$2.5 million overrun. Such data are misleading and

**Appendix II: Lack of Reliable EVM Data  
Limits DOD's Ability to Estimate Schedule  
and Cost for Constructing the CWDF**

skew the project's overall performance. As indicated in table 3, this is just one example of accounting system errors. In the case of the Moscow project management task, Parsons officials explained that this error occurred because the budget for this account was misaligned and, therefore, caused a false cost variance. Parsons officials stated they would be issuing an internal change order to correct this mistake.

**Table 3: Examples of Accounting System Errors Understating the Variance at Completion from January 2006 Report**

Dollars in millions

	<b>Work scheduled</b>	<b>Work performed</b>	<b>Actual costs</b>	<b>Budget at completion</b>	<b>Estimate at completion</b>	<b>GAO analysis of variance at completion understated by</b>
Design task (27); task management	\$2.1	\$2.1	\$5.5	\$2.1	\$2.1	\$3.4
Design task (27); project management, Moscow	\$0.1	\$0.1	\$2.6	\$0.1	\$0.1	\$2.5
Design task (27); construction packages	\$9.4	\$9.0	\$20.2	\$9.9	\$9.9	\$10.3

Source: GAO analysis of Parsons data.

Until Parsons' management updates the company's accounting system, these types of manual adjustments will have to be made through monthly change orders to ensure that costs are properly aligned with the correct budget. Such continuous adjustments do not allow the EVM system to provide timely and accurate information to Parsons and DOD managers.

In addition, DOD guidance and best practices require program managers to conduct an integrated baseline review (IBR) as needed to ensure that the baseline for tracking cost, technical information, and schedule status reflects (1) all tasks in the statement of work, (2) adequate resources in terms of staff and materials to complete the tasks, and (3) integration of the tasks into a well-defined schedule. Program managers are required to use EVM reports that have been validated by an IBR. Without verifying the baseline, monthly EVM reporting—which tracks project work against a set budget and schedule—is insufficient and invalid.

Parsons and DOD officials explained that while an IBR has been discussed, one will not be conducted until the contract for completing Building 101 has been awarded. DOD officials estimate that the contract-award process may not be completed until June 2006, resulting in a 1 year

delay. Such a delay not only prevents Parsons from holding an IBR, but it also jeopardizes DOD's ability to accurately estimate the cost and schedule to complete the CWDF program. Until the costs have been negotiated for building the remainder of Building 101, it is unclear whether the CWDF at Shchuch'ye will be completed on time and within budget. DTRA officials explained that if the costs for this effort exceed the original estimate, they will have to cover the shortfall using management reserve funds. Using management reserve funds for construction leaves less contingency funding available to complete and test the Shchuch'ye facility.

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### **DCMA and DCAA Have Concerns with Parsons' EVM Implementation**

Until December 2004, DTRA was using EVM data from a simplified Parsons EVM process. In September 2004, DTRA directed Parsons to implement a complete EVM system that was capable of being validated by DCMA. Although Parsons' EVM validation was originally scheduled for March 2005, Parsons was unable to meet this deadline and requested a series of extensions. In September 2005, DCMA officials visited the Shchuch'ye site for a program assistance visit and then returned in mid-November 2005 to conduct the formal validation review, 8 months later than planned.

DOD requires all EVM systems to go through a compliance audit or "validation" conducted by DCMA, with assistance from DCAA. The evaluation team looks for proof that the system meets the 32 criteria<sup>1</sup> for a good EVM system, as well as 2 to 3 months of reliable EVM data. While the DCMA official who led the validation team saw much improvement in Parsons' EVM system from September to November 2005, he stipulated that an EVM compliance audit only tests whether the contractor has a good, capable EVM system and knows how to use it. A compliance audit does not identify whether the system is used properly, the data are reliable, or the products of the system are read and acted upon by management. The DCMA official stated that continual surveillance of Parsons' EVM system would be necessary to ensure these actions were occurring. According to the official, DCMA does not expect to perform surveillance for the Shchuch'ye project.

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<sup>1</sup>The American National Standards Institute/Electronic Industries Alliance guidance identifies 32 criteria that reliable EVM systems should meet. The criteria are organized into five categories: organization, planning and budgeting; accounting; analysis; and revisions and data maintenance.

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**Appendix II: Lack of Reliable EVM Data  
Limits DOD's Ability to Estimate Schedule  
and Cost for Constructing the CWDF**

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DCAA also participated in Parsons' EVM validation and produced a corrective action report stating that its EVM accounting process was inadequate. Specifically, Parsons did not provide adequate documentation that direct costs of almost \$300,000 were based on accurate and reliable accounting data. The source of the accounting data used by Parsons may be unreliable, causing actual costs for September 2005 to be significantly understated. For September 2005, Parsons subtracted almost \$1 million without providing sufficient data that the adjustment was reasonable and allowable. A DCAA official stated that these findings are the result of Parsons' reliance on an outdated accounting system that has difficulty capturing actual costs for the Shchuch'ye project into a proper cost ledger. The official noted that the software Parsons uses to query the accounting system and pull data into the EVM reports also caused errors. DCAA was also concerned with Parsons' ability to apply effective EVM data quality control. According to DCAA officials, Parsons' management should have discovered such accounting errors before the EVM report was released to DOD. DCAA therefore questioned whether Parsons can generate correct accounting data and recommended that Parsons update its accounting system.

# Appendix III: Comments from the Department of Defense



NUCLEAR AND CHEMICAL  
AND BIOLOGICAL DEFENSE  
PROGRAMS

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

May 19, 2006

Mr. Joseph A Christoff  
Director, International Affairs and Trade  
U.S. Government Accountability Office (GAO)  
441 G Street N.W.  
Washington, DC 20548

Dear Mr. Christoff:

This is the Department of Defense (DoD) response to the GAO draft report 06-692, "COOPERATIVE THREAT REDUCTION: DOD Needs More Reliable Data to Better Estimate the Cost and Schedule of the Shchuch'ye Facility," dated May 3, 2006 (GAO Code 320363).

The Department concurs with the report. Suggested technical and editorial corrections to the report were provided separately. The detailed comments to each report recommendation are provided in the enclosure.

The Department appreciates the opportunity to review and comment on the draft report.

Dale Klein

Enclosure:  
As stated

cc:  
DIR DTRA  
DASD NP

GAO DRAFT REPORT DATED MAY 3, 2006  
GAO-06-692 (GAO CODE 320363)

"COOPERATIVE THREAT REDUCTION: DOD NEEDS MORE  
RELIABLE DATA TO BETTER ESTIMATE THE COST AND  
SCHEDULE OF THE SHCHUCH'YE FACILITY"

DEPARTMENT OF DEFENSE COMMENTS  
TO THE GAO RECOMMENDATIONS

RECOMMENDATION (A): The GAO recommended that the Secretary of Defense direct the Defense Threat Reduction Agency, in conjunction with the U.S. Army Corps of Engineers to ensure that the Parsons' Earned Value Management (EVM) system contains valid, reliable data and that it reflects actual cost and schedule conditions.

DOD RESPONSE: DoD concurs. The Defense Threat Reduction Agency (DTRA), the U.S. Army Corps of Engineers (COE), the Defense Contract Management Agency (DCMA), and the Defense Contract Audit Agency (DCAA) continue to work collaboratively with Parsons to ensure that the Parsons' Earned Value Management (EVM) system contains valid, reliable data and that it reflects actual cost and schedule conditions. Parsons' EVM data continues to improve and is now being used by Parsons, COE, and DTRA managers to manage the program. However, more work will be done to improve its quality. For example, over the next few months, software upgrades will be made to make the EVM data more user friendly. DoD surveillance and improvement of the EVM system will continue using its own technical experts and assistance from DCMA/DCAA. DCMA validation of the EVM system is pending the resolution of DCAA identified faults in Parsons' accounting system.

RECOMMENDATION (B): The GAO recommended that the Secretary of Defense direct the Defense Threat Reduction Agency, in conjunction with the U.S. Army Corps of Engineers, to withhold a portion of Parsons' award fee until the EVM system produces reliable data.

DOD RESPONSE: DoD partially concurs. No direction from the Secretary of Defense is required. DoD already withheld a portion of Parsons' award fee in a previous period based on the EVM system. This is a standard management technique practiced by DoD. However, DoD cannot prejudge Parsons and predetermine an award fee based on a GAO recommendation. An award fee must be based on the merits of the performance, according to the contract's award fee criteria.

RECOMMENDATION (C): The GAO recommended that the Secretary of Defense direct the Defense Threat Reduction Agency, in conjunction with the U.S. Army Corps of



Engineers to require Parsons to perform an integrated baseline review after awarding the contract for completing Building 101.

**DOD RESPONSE:** DoD Concur. DoD and Parsons always intended to conduct an integrated baseline review of the project after Parsons awarded the contract for completing building 101.

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# Appendix IV: GAO Contact and Staff Acknowledgments

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## GAO Contact

Joseph Christoff (202) 512-8979 or [christoffj@gao.gov](mailto:christoffj@gao.gov)

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## Acknowledgments

In addition to the individual named above, Muriel Forster (Assistant Director), Jerome Brown, Lynn Cothorn, Jennifer Echard, David Hancock, Beth Hoffman León, and Karen Richey contributed to this report. Joanna Chan, Martin DeAlteriis, Mark Dowling, Jennifer Mills, and Jena Sinkfield also provided assistance.

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