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MINE SAFETY

MSHA's Programs for Ensuring the Safety and Health of Coal Miners Could Be Strengthened

Statement for the Record by Robert E. Robertson, Director
Education, Workforce, and Income Security Issues



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Highlights

Highlights of GAO-06-370T, a report to Subcommittee on Labor, HHS and Education, Committee on Appropriations, U.S. Senate

Why GAO Did This Study

The Chairman, Subcommittee on Labor, HHS and Education, Senate Committee on Appropriations, asked GAO to submit a statement for the record highlighting findings from our 2003 report on how well the Department of Labor's Mine Safety and Health Administration (MSHA) oversees its process for reviewing and approving critical types of mine plans and the extent to which MSHA's inspections and accident investigations processes help ensure the safety and health of underground coal miners.

What GAO Recommends

In our September 2003 report, GAO recommended that MSHA

- monitor the timeliness of inspections conducted as part of the 6-month review of certain mine plans;
- ensure that mine operators are correcting hazards identified during inspections in a timely manner;
- develop a plan for addressing anticipated shortages in the number of qualified inspectors due to upcoming retirements; and
- revise the systems used to collect information on accidents and investigations.

Although MSHA did not comment on our recommendations in its written response to the report, it subsequently agreed to implement all of the recommendations. We have not, however, evaluated the effectiveness MSHA's actions.

www.gao.gov/cgi-bin/getrpt?GAO-06-370T.

To view the full product, including the scope and methodology, click on the link above. For more information, contact Robert E. Robertson at (202) 512-7215 or robertsonr@gao.gov.

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MSHA's Programs for Ensuring the Safety and Health of Coal Miners Could Be Strengthened

What GAO Found

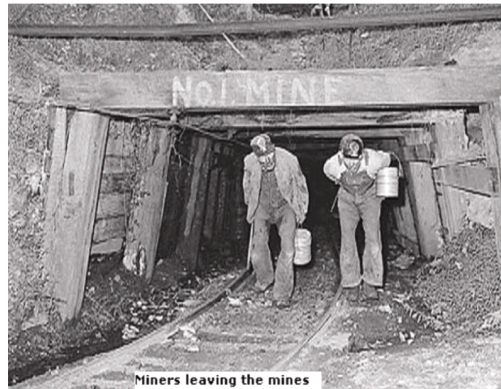
As of 2003, to help ensure the safety and health of underground coal miners, MSHA staff reviewed and approved mine plans, conducted inspections, and investigated serious accidents. In these three areas, MSHA had extensive procedures and qualified staff. However, we concluded that MSHA could improve its oversight, guidance, and human-capital-planning efforts.

We found that MSHA was not effectively monitoring a few key areas. MSHA headquarters did not ensure that 6-month inspections of ventilation and roof support plans were being completed on a timely basis. This failure could have led to mines operating without up-to-date plans or mine operators not following all requirements of the plans. Additionally, MSHA officials did not always ensure that hazards found during inspections were corrected promptly. Gaps were found in the information that MSHA used to monitor fatal and nonfatal injuries, limiting trend analysis and agency oversight. Specifically, the agency did not collect information on hours worked by independent contractors staff needed to compute fatality and nonfatal injury rates for specific mines, and it was difficult to link information on accidents at underground coal mines with MSHA's investigations.

We also concluded that the guidance provided by MSHA management to agency employees could be strengthened. Some inspections procedures were unclear and were contained in many sources, leading to differing interpretations by mine inspectors. The guidance on coordinating inspections conducted by specialists and regular inspectors was also unclear, resulting in some duplication of effort.

Finally, as of 2003, although about 44 percent of MSHA's underground coal mine inspectors were going to be eligible to retire within 5 years, the agency had no plan for replacing them or using other human capital flexibilities available to retain its highly qualified and trained inspectors.

Miners Exiting an Underground Coal Mine



Source: Mine Safety and Health 2000 calendar.

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Mr. Chairman and Members of the Committee:

I am pleased to have the opportunity to comment on important issues related to the recent tragedies in the coal mining community. The oversight that the Department of Labor's Mine Safety and Health Administration (MSHA) provides over coal mines is an essential element of properly safeguarding the lives of the thousands of workers who provide us with much of the fuel needed to meet the increasing energy needs of our country.

In 1977, Congress gave much of the responsibility for ensuring the safety and health of mine workers to MSHA. Since that time, the nation's mines have become much safer—the number of deaths dropped dramatically in the past 25 years and injury rates are also lower. However, despite these trends, mining remains a dangerous industry, as the recent tragic deaths illustrate. Data collected by MSHA on serious injuries (those involving days away from work) shows that coal mining remains one of the most dangerous industries in the United States.

My statement is based on work we reported in September 2003 and presents key findings and recommendations from that report.¹ That work was completed in accordance with generally accepted government auditing standards.

In summary, we reported in 2003 that

- Although MSHA devoted substantial effort to reviewing and approving mine plans, it did not provide adequate oversight of the plan approval process. MSHA had extensive procedures for approving mine plans and, for two of the three types of plans we reviewed—ventilation and roof support² plans—assigns highly qualified staff to the review and approval process. However, MSHA headquarters did not verify that mine operators were updating the plans as required. As a result, some mines may have been operating without adequate ventilation or roof support plans, which could have directly affected the safety and health of mine workers.

¹See U.S. General Accounting Office, *Mine Safety: MSHA Devotes Substantial Effort to Ensuring the Safety and Health of Coal Miners, but Its Programs Could Be Strengthened*, GAO-03-945 (Washington, D.C.: Sept. 5, 2003).

²MSHA refers to these plans as “roof control” plans.

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- MSHA had extensive procedures for conducting inspections of mines, had highly trained and experienced staff, and conducted most mine inspections as required. However, the extent to which the inspections process helped ensure the safety and health of mine workers was limited by several factors. For example, we found that, from 1993 to 2002, MSHA headquarters did not provide adequate oversight to ensure that mine operators corrected hazards identified during inspections. In addition, as of 2003, MSHA had no plan for addressing the fact that about 44 percent of its inspectors were going to be eligible to retire within 5 years.
 - MSHA had a comprehensive process for conducting investigations of mine accidents, but it did not use the process to the fullest extent possible to improve the future safety and health of mine workers. Weaknesses in the databases MSHA used to track mine accidents and accident investigations limited its ability to monitor trends in mine hazards and ensure that all serious accidents were investigated.

We made a number of recommendations to the Secretary of Labor designed improve MSHA's ability to protect the safety and health of coal miners by providing better oversight over its operations and improving its mine plan review and approval, inspections, and accident investigation processes. We are pleased that MSHA has taken action to implement these recommendations. We have not, however, examined the effectiveness of the agency's actions or the extent to which these actions have addressed the issues we reported in 2003.

Background

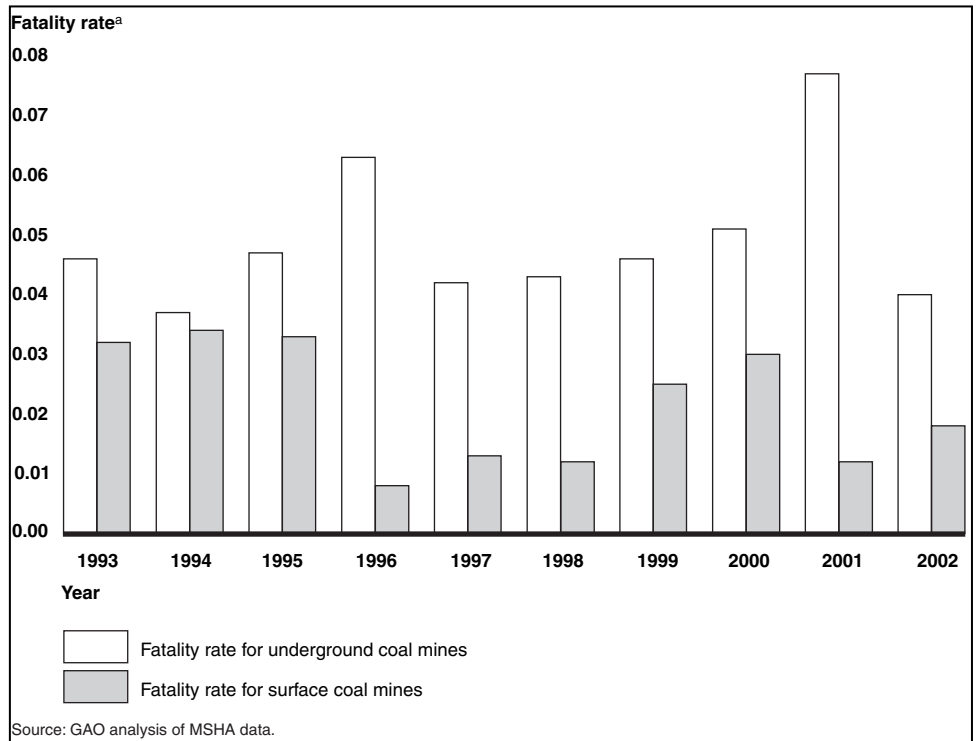
In passing the Federal Mine Safety and Health Act of 1977 (the "Mine Act"), Congress gave much of the responsibility for ensuring the safety and health of mine workers to MSHA. Under the stringent requirements of the Mine Act, MSHA must protect the health and safety of miners by thoroughly inspecting each underground coal mine at least four times a year, citing mine operators for violations of the Mine Act, ensuring that hazards are quickly corrected, restricting operations or closing mines for more serious violations, and investigating serious mine accidents. In addition, MSHA must approve the initial plans that mine operators prepare for essential systems that protect mine workers—such as ventilation and roof support systems—and revisions to the plans. To carry out these responsibilities, in 2003, MSHA had approximately 350 inspectors and 210 specialists in eleven district offices.

At the end of 2002, the United States had approximately 2,050 coal mines—about 700 underground coal mines and 1,350 surface mines. From 1993 to 2002, the number of underground and surface coal mines in the

United States declined and the number of mine workers decreased. Despite this decrease in the number of mines and miners, production remained constant because of the increased use of mechanized mining equipment and more efficient mining techniques. In addition, over the past several decades, coal production has shifted from primarily underground mines to large surface mines, including mines in Wyoming and other areas west of the Mississippi that produce millions of tons of coal annually.

Underground coal mines are more dangerous than surface mines for several reasons. One critical factor that contributes to the hazardous working conditions is highly explosive methane gas, which is often produced in large quantities when coal is extracted from underground mines. Additional factors are the geological conditions in many areas of the country that make the roofs of mines unstable, the danger posed by fire in an underground mine, coal and silica dust that can cause silicosis and pneumoconiosis (black lung disease), and the close proximity of unknown areas of abandoned mines, which can lead to flooding of the mine. As shown in figure 1, for the 10-year period from 1993 to 2002, fatality rates for underground coal mines were much higher than those for surface mines.

Figure 1: Fatality Rates for Underground and Surface Coal Mines, 1993 to 2002



MSHA Devoted Substantial Effort to Approving Mine Plans, but Did Not Provide Adequate Oversight of the Approval Process

MSHA had extensive procedures and highly qualified staff for approving two of the three types of plans we reviewed—ventilation and roof support plans—and most of these plans were reviewed and approved on a timely basis. However, MSHA headquarters did not adequately monitor completion of required inspections of the ventilation and roof support plans; data maintained by the district offices indicates that some districts were not completing these inspections as required. In addition, MSHA headquarters had not provided clear guidance to the districts on coordinating inspections related to mine plans with quarterly inspections of underground coal mines in order to avoid duplication of effort by district staff. Finally, staffing shortages prevented MSHA from reviewing and approving plans for containing debris produced by the mines on a timely basis.

MSHA had extensive procedures for approving ventilation and roof support plans. Mine operators were required to submit their initial ventilation and roof support plans to the MSHA district in which the mine was located for approval prior to operating a mine and were required to

submit revised plans to the district for approval at least every 6 months.³ The district managers were ultimately responsible for approving ventilation and roof support plans submitted to their districts. Generally, districts were required to approve ventilation and roof support plans within 45 days of receipt unless problems are found that must be resolved. In some of the districts we visited, state mine agencies were also required to approve the mine plans. We reviewed this information for a 5-year period, 1998 to 2002, and found that most districts approved these plans on a timely basis.

However, MSHA headquarters did not adequately monitor completion of required inspections of ventilation and roof support plans by the district offices. Districts were required to conduct inspections at least once every 6 months of the ventilation and roof support plans in order to ensure that mine operators were following the requirements of the plans and that they were updating the plans to reflect changes in the ventilation and roof support systems. The specialists who reviewed the mine plans during the approval process also conducted many of these inspections. Our analysis of the information submitted by the district offices to MSHA headquarters on the completion of these inspections for the 5-year period from 1998 to 2002 indicated that several districts had not completed the inspections as required. As a result of districts not completing these inspections, some mines may have been operating without adequate ventilation or roof support plans.

Inspections of the mines' ventilation and roof support plans are essential in ensuring adequate airflow and controlling the accumulation of dust particles in underground coal mines as well as ensuring that the roofs are adequately supported. Inadequate ventilation systems or roof support systems can directly affect the safety and health of mine workers. For example, our review of MSHA's data on fatalities at underground coal mines from 1998 to 2002 showed that problems related to ventilation and roof support systems accounted for high proportions of fatalities in underground coal mines. For this 5-year period, ignitions or explosions from excessive gas or coal dust accounted for the third largest percentage of all fatalities—14 percent—and roof falls accounted for the largest percentage—34 percent.

³Mine operators were required to submit revised ventilation and roof support plans to the district for approval whenever significant changes were made to the plans.

In addition, MSHA did not always effectively coordinate its inspections of mine plans with the comprehensive quarterly inspections of underground coal mines in order to avoid duplication of effort by district staff. In two of the five districts we visited, we found that, in some instances, the specialists who conduct the inspections of mine plans and inspectors who conduct quarterly inspections were duplicating each other's work, resulting in an inefficient use of MSHA's resources.

MSHA is also responsible for approving plans for containing mine debris, called impoundment plans.⁴ As of 2003, MSHA had responsibility for approximately 600 coal impoundments. Many of these plans are extremely complex and require highly qualified engineers who are familiar with technical areas such as dam building techniques, hydrology, and soil conditions. Failure of an impoundment can be devastating to nearby communities, which may be flooded with water and sludge, and to the environment, affecting streams and water supplies for years afterwards. Because of the potential for failure, such as the impoundment dam failure in 1972 in Buffalo Creek, West Virginia, in which 125 people were killed and 500 homes were destroyed, MSHA is extremely careful about approving impoundment plans.⁵

At the time of our 2003 report, MSHA had conducted two reviews of its procedures for approving impoundment plans, and has begun to take steps for improving the process. One review identified several weaknesses in the procedures, including the need for the agency to develop guidance for determining which impoundment plans should receive expedited review as well as evaluating the staffing levels needed to ensure timely and complete review of the plans. MSHA officials acknowledged that the delays in the review and approval of impoundment plans had been a problem for a number of years. They also told us that they had taken a number of steps to alleviate these delays, such as hiring additional engineers to review impoundment plans and provide assistance to staff in its district offices.

⁴MSHA refers to the large embankment dams built to contain debris produced by the mines (debris that consists mainly of water, rock, and coal) as "impoundments."

⁵The Bureau of Mines had responsibility for overseeing impoundments at the time of the Buffalo Creek disaster.

MSHA Had Extensive Procedures, Highly Qualified Staff, and Conducted Most Quarterly Inspections as Required, but Its Inspection Process Could Have Been Improved

MSHA's procedures for conducting inspections of underground coal mines were comprehensive; its inspectors were highly qualified; and it conducted almost all quarterly inspections as required, but the agency's inspection process could be improved in a number of ways. Although MSHA had extensive inspection procedures, some of them were unclear, while others were difficult to locate because they were contained in so many different sources. In addition, MSHA conducted over 96 percent of required quarterly inspections each year over the 10-year period from 1993 to 2002, but MSHA headquarters did not provide adequate oversight to ensure that its district offices followed through to make sure that unsafe conditions identified during inspections were corrected by the deadlines set by inspectors. And, although MSHA had highly qualified inspectors, as of 2003, it had no plan for addressing the fact that about a large percentage of them (44 percent) were going to be eligible to retire within 5 years. Finally, MSHA did not collect all of the information it needed to assess the effectiveness of its enforcement efforts because it did not collect data on contractor staff who work at each mine.

Although MSHA had extensive inspection procedures, we found that some of them were unclear and were located in so many different sources that they could be difficult to find. Some procedures did not clearly specify the criteria inspectors should use in citing violations. For example, several district officials in two of the districts we visited told us that the lack of specific criteria for floating coal dust made it difficult to determine what was an allowable level.⁶ As a result, mine inspectors had to rely on their own experience and personal opinion to determine if the accumulation of floating coal dust was a safety hazard that constituted a violation. In some instances, according to the inspectors and district managers, this led to inconsistencies in inspectors' interpretations of the procedures; inspectors have cited violations for levels of floating coal dust that have not brought citations from other inspectors. In addition, the inspections procedures were located in so many different handbooks, manuals, policy bulletins, policy letters, and memorandums that it could be difficult for inspectors to make sure that they were using the most recent guidance and procedures. MSHA headquarters officials told us that they were working to clarify the agency's procedures and consolidate the number of sources in which they were located.

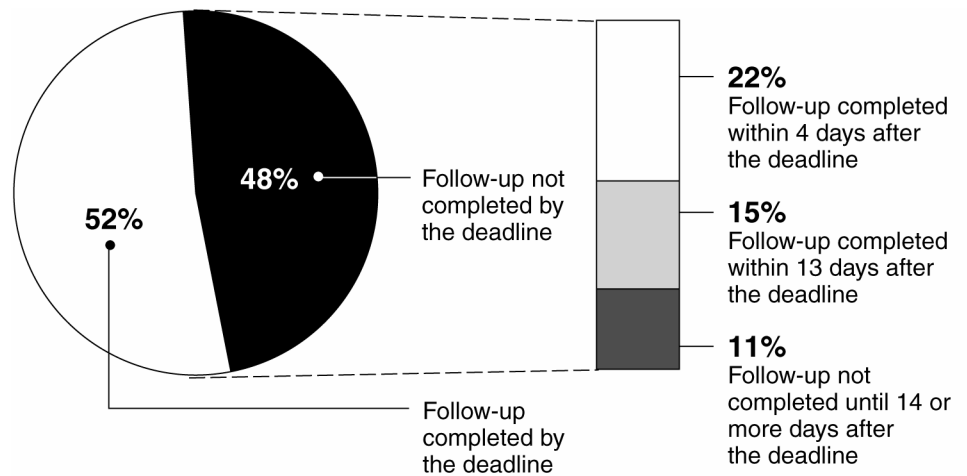
⁶MSHA referred to this as "float" coal dust. It is extremely combustible and can cause explosions in underground coal mines.

MSHA's data on its quarterly inspection completion rates indicated that, from fiscal year 1993 to 2002, its district offices completed over 96 percent of these inspections as required. However, MSHA headquarters did not monitor district office performance to ensure that inspectors followed up with mine operators to determine that unsafe conditions identified during these inspections were corrected. The deadlines that inspectors set for mine operators to correct safety and health hazards varied based on a number of factors, including the degree of danger to miners affected by the violation. They ranged from 15 minutes from the time the inspector wrote the citation to 27 days afterwards. MSHA's procedures required inspectors to follow up with mine operators within the deadline set or to extend the deadline. Inspectors could extend the deadlines under certain circumstances, such as when a mine had temporarily shut down its operations or when a mine operator was unable to obtain a part needed to correct a violation cited for a piece of equipment.

Our analysis of MSHA's data for the 10-year period from 1993 to 2002 showed that, for almost half of the 536,966 citations for which a deadline was established, inspectors did not follow up in a timely manner to make sure mine operators had corrected the hazards.⁷ However, as shown in figure 2, of the citations for which the inspectors did not follow up on a timely basis, they followed up on most within 4 days of the deadline and, for all but 11 percent of the citations, they followed up within 14 days.

⁷MSHA did not set a deadline for correction of every type of violation. For example, inspectors were not required to set a deadline for an order in which the mine was closed due to "imminent danger."

Figure 2: Percentage of All Citations Issued from 1993 to 2002 for Which Inspectors Did Not Follow Up by the Specified Deadlines



Source: GAO analysis of MSHA data.

The more serious type of violations—“significant and substantial” violations—accounted for a significant proportion of the citations for which inspectors did not follow up by the deadlines. For the over 235,447 significant and substantial violations from 1993 to 2002 for which a deadline was specified, inspectors did not follow up on more than 48 percent of the citations by the deadline. However, inspectors followed up on all but about 10 percent of the citations for significant and substantial violations within 14 days of the deadline.

MSHA headquarters and district officials told us that there were many different reasons why inspectors may not have followed up by the deadlines specified in their citations. One of these, according to several district officials, was scheduling conflicts that prevented inspectors from visiting the mine within the specified deadline. In addition, there were circumstances in which inspectors were not able to follow up, such as when a mine operator suspended a mine’s operations. However, in these instances, the inspector should have updated the database to show that the deadline was extended.

In addition, although we found that, as of 2003, about 44 percent of MSHA’s highly trained and experienced underground coal mine inspectors would be eligible to retire within 5 years—and the agency’s historic attrition rates indicated that many of them would actually retire—the agency had not developed a plan for replacing these inspectors. MSHA also had fewer inspector trainees on board than vacancies that would need

to be filled when inspectors retired. MSHA headquarters officials told us that it would be difficult for them quickly hire and train replacements for the inspectors who retired. In addition to the fact that at least 18 months were needed to train each new inspector, it took the agency several months from the date an individual retired to advertise and fill each vacant position. As a result of losing these inspectors, MSHA may find it difficult to complete all quarterly inspections of underground coal mines.

MSHA also did not collect all of the information on contractor staff who work in underground coal mines needed to assess the effectiveness of its enforcement activities. Because MSHA does not collect information on injuries to or hours worked by contractor staff who mine coal in each underground coal mine, it cannot calculate accurate fatality or nonfatal injury rates for mines that use contractor staff to mine coal—rates used to evaluate the effectiveness of its enforcement efforts. In addition, MSHA could not track trends in fatal or nonfatal injury rates at specific mines to use to target its enforcement resources. The fact that MSHA did not track the number of contractor staff who worked in each mine was important because the proportion of miners who work for contractors had grown significantly since 1981, when they represented only 5 percent of all mine workers. Our analysis showed that the percentage of underground coal miners who work for contractors increased from 13 percent in 1993 to 18 percent in 2002, and the percentage who incurred nonfatal injuries also increased over this period.

MSHA Had a Comprehensive Process for Conducting Accident Investigations, but Did Not Fully Utilize It to Prevent Future Accidents

MSHA had extensive guidance and thorough procedures for conducting accident investigations, but it did not use these investigations to the fullest extent to improve the future safety of mine workers. Although MSHA had detailed policies and rigorous requirements for how investigations must be conducted and reported, weaknesses in its databases made it difficult for MSHA to track key data on mine hazards and potentially useful indicators of its own performance.

We made several recommendations in our report designed to improve MSHA's operations. We recommended that the Secretary of Labor direct the Assistant Secretary for Mine Safety and Health to

- monitor the timeliness of inspections of ventilation and roof control plans to ensure that all inspections are completed by district offices as required;
- monitor follow-up actions taken by its district offices to ensure that mine operators are correcting hazards identified during inspections on a timely basis;

-
- update and consolidate guidance provided to its district offices on plan approval and inspections to eliminate inconsistencies and outdated instructions, including clarifying guidance on coordinating regular quarterly inspections of mines with other inspections;
 - develop a plan for addressing anticipated shortages in the number of qualified inspectors due to upcoming retirements, including considering options such as streamlining the agency's hiring process and offering retention allowances;
 - amend the guidance provided to independent contractors engaged in high-hazard activities requiring them to report information on the number of hours worked by their staff at specific mines so that MSHA can use this information to compute the injury and fatality rates used to measure the effectiveness of its enforcement efforts; and
 - revise the systems MSHA uses to collect information on accidents and investigations to provide better data on accidents and make it easier to link injuries, accidents, and investigations.

MSHA did not comment on the recommendations in its written response to the report and disagreed with some of our findings. However, MSHA later agreed to implement all of the recommendations and provided us with information on how it had implemented or was in the process of implementing them. We are pleased that MSHA has taken action to implement these recommendations but note that we have not examined the effectiveness of the agency's actions or the extent to which these actions have addressed the issues we reported in 2003.

GAO Contact and Staff Acknowledgments

For further information, please contact Robert E. Robertson at (202) 512-7215. Individuals making key contributions to this testimony include Revae Moran and Karen Brown.

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