

May 2007

MINE SAFETY

Better Oversight and Coordination by MSHA and Other Federal Agencies Could Improve Safety for Underground Coal Miners





Highlights of [GAO-07-622](#), a report to congressional requesters

Why GAO Did This Study

The Mine Safety and Health Administration (MSHA), the National Institute for Occupational Safety and Health (NIOSH), the Federal Mine Safety and Health Review Commission, the Department of Labor's Office of the Solicitor, the states, and the mining industry share responsibility for ensuring mine safety.

GAO examined the challenges underground coal mines face in preparing for emergencies, how well MSHA oversees mine operators' training efforts, how well MSHA and NIOSH coordinate to enhance the development and approval of mine safety technology, and how civil penalties are assessed. To address these issues, GAO surveyed a representative sample of active underground coal mines, analyzed agency data, conducted site visits, and talked with agency officials and other experts. The survey results are estimated at the 95 percent confidence level.

What GAO Recommends

GAO is making recommendations to strengthen the efforts of MSHA, Labor, NIOSH, and the Commission by improving mine operators' access to tools to train their workers, strengthening MSHA's oversight of training, improving the effectiveness of information sharing between MSHA and NIOSH, and ensuring that there is transparency in penalty appeal determinations. Each agency generally agreed with the recommendations in the report.

www.gao.gov/cgi-bin/getrpt?GAO-07-622.

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

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What GAO Found

Underground coal mine operators face significant challenges preparing for emergencies, including ensuring that miners receive realistic training and organizing mine rescue teams that satisfy new requirements. While mine operators recognize the importance of providing training in an environment that simulates an emergency, many of them are challenged by having limited access to special training facilities and meeting the cost of providing such training. MSHA has materials for providing specific hands-on training for mine emergencies, but it does not provide all mine operators with information and tools for training under simulated emergency conditions. In addition to the challenges of providing miners with realistic training, mine operators anticipated challenges in implementing the mine rescue team requirements in recent legislation, such as meeting the requirement to conduct training annually at each mine covered by a mine rescue team.

MSHA approves mine operators' training plans and inspects their training records, but its oversight of miner training is hampered by several factors. MSHA has general guidelines for items to be considered when approving new instructors, but its standards are inconsistent, and it has no continuing education requirements for instructors. MSHA also does not have current information on its instructors and does not ensure that they keep their knowledge and skills up to date. In addition, MSHA does not adequately monitor instructors or evaluate training sessions, and does not assess how well miners are learning the skills being taught.

MSHA and NIOSH have a common mission to improve the safety and health of coal miners, but do not have a current memorandum of understanding to guide their coordination efforts or formally involve each other in strategic planning efforts. As a result, coordination between the two agencies is largely informal and inconsistent. Most of the coordination that occurs is initiated by individual staff members or by outside parties. Such informal coordination may not be sufficient given the pending retirements of many engineers and scientists and other challenges that both agencies face.

While most of the penalties proposed by MSHA are paid by mine operators without opposition, a small percentage of the cases involving more serious and higher dollar penalties are appealed, and those appealed are reduced significantly. Between 1996 and 2006, MSHA proposed assessing mine operators 506,707 penalties for violations of underground coal mine safety and health standards—at an average penalty amount of \$234 per violation. MSHA uses a standard formula to propose penalties, but the other entities involved in the appeals process such as Labor's Solicitor's Office use considerable discretion in deciding on the final penalty amount. Approximately 6 percent (31,589) of the violations were appealed by mine operators. About half of the penalties for the appealed violations were reduced by an average of 49 percent, regardless of the seriousness of the gravity of the violation and the degree of operator's negligence.

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Abbreviations

ALJ	administrative law judge
APA	Administrative Procedures Act
CLR	conference litigation representative
ETS	Emergency Temporary Standard
MINER Act	Mine Improvement and New Emergency Response Act of 2006
MSHA	Mine Safety and Health Administration
MSIS	MSHA Standardized Information System
NIOSH	National Institute for Occupational Safety and Health
SCSR	self-contained self-rescuer

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United States Government Accountability Office
Washington, DC 20548

May 16, 2007

Congressional Requesters

In January 2006, the Sago mine accident in West Virginia brought the nation's attention to the perils workers face in underground coal mining when 12 men lost their lives after an explosion prompted them to barricade themselves in the mine to await rescue—an effort that took close to 2 days to complete. In total, 47 coal miners lost their lives in 2006, interrupting a 10-year trend of declining fatalities in this industry. Coal, which is used to produce almost 50 percent of the nation's electricity, is becoming more and more important to the nation's energy policy as the demand for electricity increases. Mining productivity is at an all-time high—averaging more than 6 tons per coal miner per hour, or more than 48 tons in an 8-hour day. As production increases, safety and the oversight of mines' working conditions assume even greater significance than before.

Through the Department of Labor's (Labor) Mine Safety and Health Administration (MSHA), the federal government enforces the provisions of the Federal Mine Safety and Health Act of 1977, as amended (Mine Act) and the recently enacted requirements of the Mine Improvement and New Emergency Response Act of 2006 (MINER Act). Under these laws, MSHA is responsible for approving training programs for mine workers; promulgating regulations regarding training requirements for rescue teams; approving certain technology devices used underground; and inspecting underground coal mines at least four times each year, which can result in citations and penalties for safety and health violations. The Department of Health and Human Services' National Institute for Occupational Safety and Health's (NIOSH) Office of Mine Safety and Health shares some responsibilities for improving mine safety. It identifies the causes of work-related diseases and injuries; researches, develops, and tests new technologies and equipment designed to enhance mine safety and health; and recommends safety and health standards. In addition, many states maintain mine safety agencies that conduct inspections and require mines to adhere to state safety and health laws and regulations. Finally, mine operators maintain responsibility for implementing safety and health standards to ensure that their workers are working under safe conditions on a daily basis. In response to concerns about the safety of underground coal mines, spawned by the recent increase in fatal mine accidents, you asked us to review several aspects of mine safety oversight.

We examined (1) the challenges underground coal mines face in preparing for mine emergencies, (2) how well MSHA oversees mine operators' training efforts, (3) how well MSHA and NIOSH coordinate their efforts to enhance the development and approval of mine safety technology, and (4) how civil penalties are assessed when underground coal mine operators violate safety and health standards.

To conduct our work, we reviewed relevant laws and regulations that govern MSHA, the Federal Mine Safety and Health Review Commission, and NIOSH, as they applied to our research. In addition, we reviewed relevant decisions issued by the Commission and its administrative law judges. We consulted with outside experts, including industry associations, union representatives, mine company officials, academics, a technology manufacturer, and other stakeholders to obtain their views on each topic. We also surveyed a sample of active underground coal mines regarding the current state of mines' operations and the challenges they face in preparing for and responding to mine emergencies. We sent questionnaires to a stratified random sample of 342 of the 665 active underground coal mines. Our sample size was reduced because of mine closures; therefore, survey estimates are representative of only those mines open for the entire period. Ultimately, 146 mines completed questionnaires for a response rate of 69 percent. Our confidence in the precision of the results from the sample is expressed in 95 percent confidence intervals. As a result, we are 95 percent confident that each of the confidence intervals in this report will include the true values in the in-scope population. All percentage estimates for our sample have margins of error—widths of confidence intervals—of plus or minus 8 percentage points or less, at the 95 percent confidence level.

In addition, we analyzed quantitative data from MSHA on citations and penalty amounts for penalties assessed from January 1996 through October 2006. The data provided by MSHA were assessed and found sufficiently reliable for our purposes. We also visited three underground coal mines, spoke with MSHA officials in 6 of its 11 coal mine districts, and interviewed state mine agency officials in the four states that contain almost 90 percent of all underground coal mines in the United States—Kentucky, Pennsylvania, Virginia, and West Virginia. Finally, we attended a mine rescue competition to observe training exercises and interview rescue team members, and visited field locations where MSHA and NIOSH conduct their research and interviewed the officials responsible for these activities. We completed our work between June 2006 and March 2007 in accordance with generally accepted government auditing standards. For

an additional discussion of the scope of our work and the methods used to conduct it, see appendix I.

Results in Brief

Underground coal mine operators face significant challenges preparing for emergencies, including ensuring that miners receive realistic training and organizing mine rescue teams that satisfy new requirements. Mine operators recognized the importance of providing emergency training in a simulated environment. However, on the basis of our survey results, an estimate of 81 percent of mine operators considered the availability of special training facilities for providing such training as a challenge, and 70 percent considered the costs of providing simulated training as a challenge. While MSHA has some materials for providing hands-on training, such as guides on practicing donning and transferring emergency breathing devices, it does not provide all mine operators with information and tools for training under simulated emergency conditions. Our survey results also indicate that an estimate of 77 percent of mines conducted evacuation drills in 2006 in which miners practiced donning breathing devices, which were part of MSHA's emergency temporary standards implemented in March 2006. However, an estimate of 44 percent of mines that conducted these drills did not have their miners practice inserting the device's mouthpiece. Initially, MSHA permitted miners to simulate this activity. However, final rules issued in December 2006 require miners to insert the mouthpiece. In addition to the challenges of providing miners with realistic training, mine operators reported that they anticipated challenges in implementing the new mine rescue team requirements of the MINER Act. For example, depending on how MSHA defines the requirement for rescue teams to train at least annually at every mine they serve, some states that currently provide mine rescue services reported that they may choose to stop providing these services because of resource constraints. As a result, affected mine operators will then have to identify and train new rescue teams. To help mines train their workers under simulated emergency conditions, we recommend that the Secretary of Labor direct MSHA to publicize information and available tools for training mine workers under such conditions. In addition, MSHA should periodically review and update this information, as appropriate.

MSHA approves mine operators' training plans and inspects their training records, but its oversight of miner training is hampered by several factors, including (1) inconsistent instructor approval standards, (2) inaccuracies in its database that maintains information on all instructors, (3) the lack of continuing education requirements for instructors once they are approved, and (4) limited agency monitoring of training sessions. MSHA has general guidelines for items to be considered when approving new instructors, but

allows districts to determine an instructor's qualifications in different ways. For example, MSHA requires that applicants prove their experience in one of three ways, and the districts have the discretion to grant provisional approval until the instructor is designated otherwise, but this approach is not consistent across districts. MSHA also does not have continuing education requirements for instructors. In addition, MSHA does not have current information on its approved instructors and does not ensure that they keep their knowledge and skills up to date. Further, MSHA does not adequately monitor instructors or evaluate training sessions, and does not assess how well miners are learning the skills being taught. To help ensure that mine workers are adequately prepared for emergencies, we recommend that the Secretary of Labor direct MSHA to strengthen its monitoring of training. This monitoring should include

- reviewing and standardizing districts' procedures for approving new instructors;
- establishing continuing education requirements for instructors to help instructors maintain or improve their knowledge and skills;
- improving the data in its records on approved instructors; and
- developing a process for monitoring miner training that includes regularly evaluating training sessions, assessing how well learning objectives are being met, and providing feedback to instructors.

Coordination between MSHA and NIOSH is primarily informal and inconsistent, and such coordination may not be sufficient given the pending retirements and other challenges both agencies face. Despite their complementary roles, MSHA and NIOSH lack a current memorandum of understanding or other formal policy to guide their agencywide coordination efforts. In addition, they do not regularly involve each other in their strategic planning efforts, including planning for research. As a result, officials told us that coordination has primarily been at the initiative of some individuals at both agencies and, as such, has not always been consistent. MSHA and NIOSH have worked together on temporary projects, such as developing a new device to monitor the amount of coal dust and other irritants to which miners are exposed, but these efforts have been temporary, limited to specific issues, and not part of either agency's standard operating procedures. Given the challenges the two agencies face, coordination based on working relationships developed between individual staff or temporary projects may not be sufficient. For example, many engineers and scientists at MSHA and NIOSH will be eligible to retire in the coming years, and informal coordination efforts may not continue after they leave. To improve the effectiveness of information sharing between MSHA and NIOSH, we recommend that the

Secretaries of Labor and Health and Human Services direct their respective agencies to work together to establish a formal memorandum of understanding to guide their coordination. In addition, the agencies should periodically review and update the memorandum, as appropriate.

While most of the penalties proposed by MSHA are paid by mine operators without opposition, a small percentage of the cases involving more serious and higher-dollar penalties are appealed, and many of those appealed are reduced significantly. MSHA proposes penalties using a standard formula established in its regulations designed to assess higher penalties for more serious violations. Recently, MSHA finalized revisions to its standard formula and expects these changes to more than double the amount of all proposed penalties. Between 1996 and 2006, MSHA proposed assessing mine operators 506,707 penalties for violations of underground coal mine safety and health standards—at an average penalty amount of \$234 per violation. While mine operators pay most penalties without opposition they appealed about 6 percent of all penalties assessed by MSHA. Of those appealed, about half of the penalties were reduced by an average of 49 percent, regardless of the gravity of the violation and the degree of the operator’s negligence. The entities involved in the appeals process—the Department of Labor’s Office of the Solicitor (Solicitor’s Office), MSHA’s conference litigation representatives (CLR), and administrative law judges (ALJ) with the independent Federal Mine Safety and Health Review Commission—are required by law to apply the six statutory factors specified in the Mine Act. However, they are not legally obligated to use any particular method to determine a new penalty amount when they determine that a reduction from MSHA’s proposed penalty is appropriate. As a result, they have considerable discretion in deciding on the final penalty amount. The recent penalty increases implemented by MSHA increase the likelihood that more penalties will be appealed. In order to ensure that there is transparency in penalty determinations, we recommend that the Solicitor’s Office, MSHA, and the Commission take steps to ensure that the specific rationale for all final penalty amounts, including reductions from MSHA’s proposed penalties, are adequately documented.

We obtained comments on a draft of this report from MSHA, Labor’s Office of the Solicitor, NIOSH, and the Commission. Each entity agreed with the recommendations. MSHA provided additional information about actions the agency has either begun or plans to take in response to the recommendations. For example, MSHA stated it will develop a Web page dedicated to providing information on available training resources and will issue an information bulletin to mine operators about this Web-based

resource. In addition, the agency provided information on its plans for improving oversight of miner training, including exploring the option of establishing continuing education requirements for approved instructors. However, the agency noted that this requirement may necessitate a regulatory change before it can be finalized. Both MSHA and NIOSH supported developing a memorandum of understanding to better guide their coordination efforts. MSHA, the Office of the Solicitor, and the Commission agreed with the need for transparency in the appeals process that includes specifying the rationale for each penalty reduction.

Background

Coal mining remains one of the nation's most dangerous professions. The deadly explosion at the Sago mine in West Virginia brought national attention to the many hazards facing underground coal miners. In response, Congress enacted the MINER Act of 2006, which required mine operators and MSHA to undertake a variety of reforms, including enhancing mine rescue teams, developing up-to-date accident response plans, and instituting higher penalties—including a criminal penalty—for the most serious violations.¹ In March 2006, MSHA also issued an Emergency Temporary Standard (ETS)² aimed at instituting immediate health and safety improvements.³ Among other requirements, these standards required operators to provide safety training on the mine's evacuation routes and provide opportunities to learn how to react in certain kinds of simulated emergency situations, install lifelines along mine escape routes, and store supplemental breathing devices underground. The elements of the ETS became a permanent regulation in December 2006, although the final regulations do modify and clarify some elements of the ETS.⁴

¹Pub. L. 109-236.

²The Mine Act gives MSHA the authority to issue an ETS when the agency determines that miners are exposed to grave danger from exposure to substances or agents determined to be toxic or physically harmful, or to other hazards, and that an emergency standard is needed to protect miners from such danger. The ETS becomes effective upon publication in the *Federal Register* and remains in effect until replaced by permanent rules that go through the regular rule-making process, but for no longer than 9 months.

³30 C.F.R. Parts 48, 50, and 75, Emergency Mine Evacuation; Final Rule, 71 Fed. Reg. 12,252 (March 9, 2006).

⁴30 C.F.R. Parts 3, 48, 50, and 75, Emergency Mine Evacuation; Final Rule, 71 Fed. Reg. 71,430 (December 8, 2006).

The underground mining industry is highly concentrated in the Appalachian region, east of the Mississippi River. Approximately 87 percent of all underground coal mines in the United States are located in Kentucky, Pennsylvania, Virginia, and West Virginia. Eight of MSHA's 11 district offices are located in these states, and MSHA's headquarters is located in Arlington, Virginia.

MSHA plays a key role in ensuring the education and training of miners, mine inspectors, and other industry stakeholders. MSHA's Directorate of Educational Policy and Development provides technical support to mine operators through its Educational Field Services, which has staff located in many of MSHA's district offices. The directorate also operates the National Mine Health and Safety Academy (Mine Academy) in West Virginia, which primarily serves as the training center for MSHA mine inspectors but is also available to federal and local government and industry personnel for training on a variety of mine health and safety topics. The Mine Academy also provides nearly all of the classroom training for newly hired MSHA mine inspector trainees and technical specialists. In addition, MSHA regulations govern the training and retraining of miners and mine rescue team members. Mine operators are required to provide at least 40 hours of training to new underground mine workers and at least 8 hours of annual training to experienced miners. The training must cover a variety of topics, such as learning the layout of the mine and proper safety procedures, and must be conducted by an MSHA-approved instructor. Miners who volunteer for mine rescue teams are generally required to pass a rigorous physical examination, complete an initial 20 hours of training on the breathing apparatus used by the team, and an additional 40 hours of annual training on issues such as reading mine maps, understanding ventilation systems, and the use of mine rescue equipment.⁵

Both MSHA and NIOSH are responsible for getting new technology into the mines. MSHA performs this role by certifying certain equipment used in a mine is safe for underground use. MSHA also provides technical support to mine inspectors and mine operators in a number of areas, such as electrical and ventilation systems, roof control, and control of coal dust. In conducting its health and safety research and development, NIOSH

⁵The MINER Act also imposes some new training requirements for mine rescue teams. MSHA is required to promulgate regulations implementing these requirements within 18 months of June 15, 2006. 30 U.S.C. § 825(e)(2).

consults with a number of different entities, including MSHA and the mining industry. NIOSH is also responsible for developing or adapting new technologies for use in the mining industry. Before the passage of the Mine Act in 1977, both mine enforcement and research were the responsibility of the Bureau of Mines, which was located in the Department of Interior. After the passage of the act, MSHA was created when the enforcement function was moved from the Bureau of Mines to the Department of Labor. In 1997, following the closure of the Bureau of Mines, mine research was placed under the auspices of the Department of Health and Human Services' Centers for Disease Control and Prevention and became a part of NIOSH.

The federal government's enforcement of mine safety and health is shared by two independent agencies—MSHA and the Commission—in a split-enforcement model that is relatively uncommon in the federal government. While MSHA is responsible for inspecting mines for safety and health violations, the Mine Act grants authority to the Commission to assess all civil penalties for violations found by MSHA. In practical terms, MSHA proposes the initial penalty based on the findings of its inspectors.⁶ However, these proposals are subject to review by the Commission, and no proposed penalty that has been contested by a mine operator can be settled without the approval of the Commission. The Commission includes five members appointed by the President and confirmed by the Senate. ALJs assist in carrying out the responsibilities of the Commission and are authorized by the Administrative Procedures Act (APA) and the Mine Act to independently review MSHA's enforcement actions. ALJ decisions are considered final decisions of the Commission unless it decides to review a case within 40 days of the ALJ decision. If MSHA or the mine operator disagrees with the Commission decision, either can appeal the case to the appropriate U.S. Court of Appeals.

In assessing penalties, the Mine Act requires both the Commission and MSHA to consider six statutory factors:

1. the mine operator's history of previous violations,
2. the appropriateness of the penalty to the size of the mine,

⁶If the penalty proposed by MSHA is not contested by the mine operator within the time allotted by law, it becomes a final order of the Commission.

-
3. whether the mine operator was negligent,
 4. the effect on the operator's ability to continue in business,
 5. the gravity of the violation, and
 6. the demonstrated good faith of the mine operator charged in quickly remedying the situation after being notified of a violation.

MSHA's Coal Mine Safety and Health Administration is responsible for carrying out enforcement activities related to surface and underground coal mines. As of January 2007, MSHA employed approximately 550 underground coal inspectors in its 11 coal districts. MSHA's principal enforcement responsibility for underground coal mines is fulfilled by conducting a minimum of four comprehensive inspections of every underground coal mine each year.⁷ When MSHA inspectors observe violations of federal health and safety standards, they are required to issue a citation to the coal mine operator.⁸ However, even if an operator does not agree with the violation, the operator must resolve the problems within the time frame set by the inspector.

Under new MSHA regulations that took effect in April 2007,⁹ the amount of a civil penalty that MSHA can assess for violation of an underground coal mine safety and health standard generally ranges from \$112 to \$60,000.¹⁰ However, the MINER Act introduced a new "flagrant violation," which carries a maximum civil penalty of \$220,000.¹¹ The MINER Act also

⁷Mines that are recognized as more dangerous, such as those containing high levels of methane gas, are inspected more frequently.

⁸MSHA inspectors are authorized to issue either a citation or a withdrawal order when they observe a health and safety violation. All withdrawal orders compel the removal of miners from the affected work areas until the observed hazard is terminated. This, in essence, could halt production in a particular area of the mine.

⁹Criteria and Procedures for Proposed Assessment of Civil Penalties; Final Rule, 72 Fed. Reg. 13,592 (March 22, 2007) (codified at 30 C.F.R. Part 100).

¹⁰Under its prior regulations, MSHA also used a "single penalty assessment" for violations that were not reasonably likely to result in a reasonably serious injury or illness, and that were abated within the time set by the inspector. The penalty for these violations was \$60. However, the new regulations eliminate the single penalty assessment.

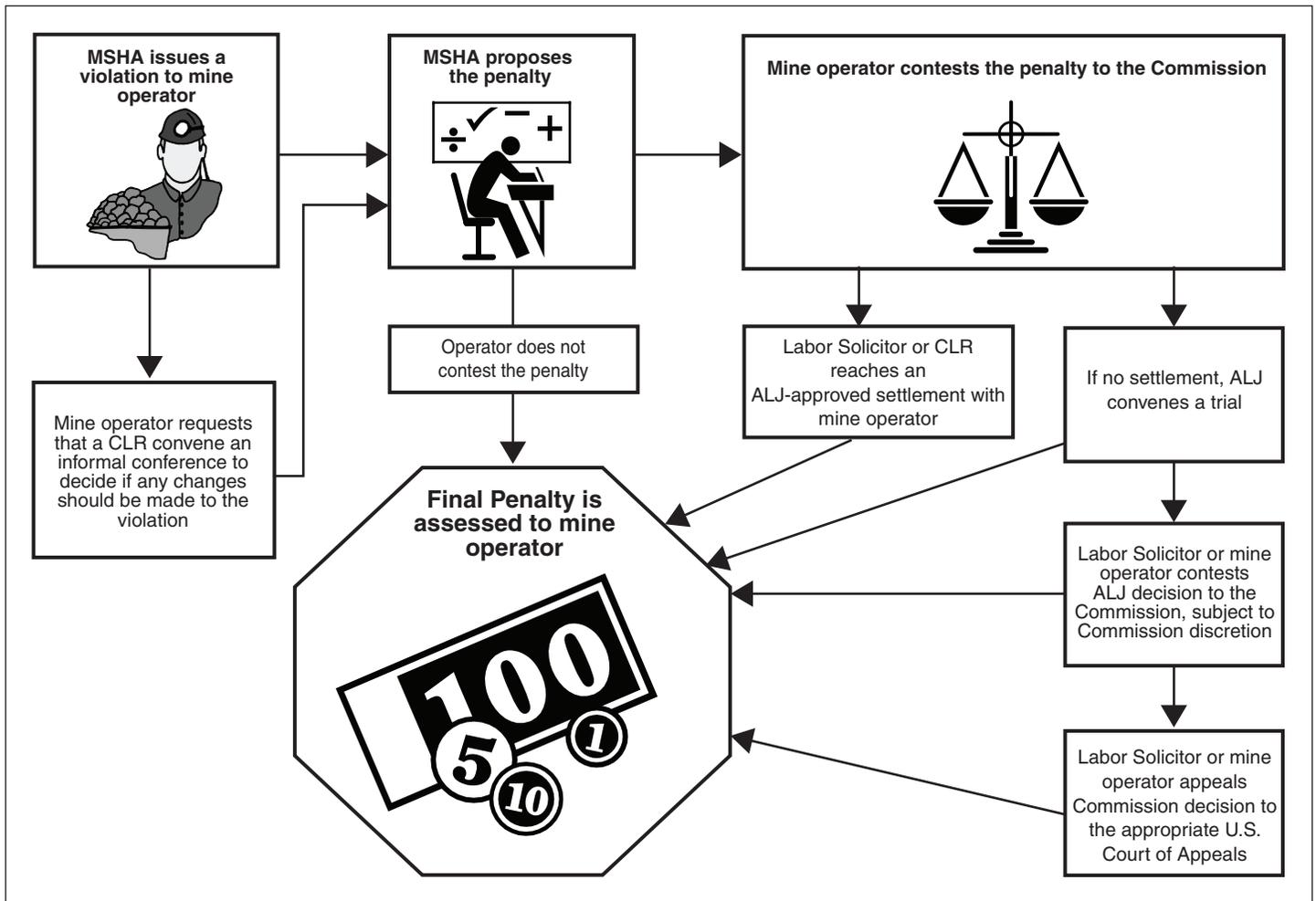
¹¹The MINER Act defines flagrant violations as those that involve "a reckless or repeated failure to make reasonable efforts to eliminate a known violation of a mandatory health or safety standard that substantially and proximately caused, or reasonably could have been expected to cause, death or serious bodily injury." 30 U.S.C. § 820(b)(2).

established criminal penalties for certain willful or knowing violations of the Mine Act.¹²

Once a penalty is proposed, a mine operator can (1) accept the proposed penalty and pay it or (2) formally contest the penalty before the Commission (see fig. 1 for a more detailed view of the process).

¹²A mine operator's first conviction under these criminal provisions may carry a fine of up to \$250,000 and imprisonment for up to 1 year. Subsequent convictions are punishable by fines of up to \$500,000 and 5 years of imprisonment. 30 U.S.C. § 820(d).

Figure 1: Penalty Assessment Process for Mine Operators That Are Cited for Violating Safety and Health Standards



Source: GAO analysis.

Note: If the citation or order is vacated by the Commission or the courts, no civil penalty is assessed.

Underground Coal Mines Face Challenges in Preparing Mine Workers and Rescue Teams for Emergencies

Underground coal mine operators face significant challenges preparing for emergencies, including ensuring that miners receive realistic training and organizing mine rescue teams that satisfy new requirements. Limited access to facilities for training miners under simulated emergency conditions and the cost of such training challenge many mine operators. While MSHA has some materials for providing hands-on training, it does not provide all mine operators with information and tools to assist them in training miners under simulated emergency conditions. In preparing mine rescue teams to respond to emergencies, mine operators reported costs and training as key challenges, and indicated that implementing new requirements in the MINER Act may exacerbate these challenges.

Emergency Preparedness Training of Miners Is Limited by Few Opportunities to Train under Simulated Emergency Conditions

Although new MSHA requirements instruct mine operators to conduct emergency preparedness training that includes realistic mine emergency evacuation drills, many mine operators had not implemented these requirements as of the end of 2006. MSHA's ETS issued in March 2006 required mine operators to provide hands-on training in the complete donning of the breathing devices miners carry with them into underground mines in the event that the breathable air becomes contaminated.¹³ On the basis of our survey, we estimate that 77 percent of underground coal mines conducted evacuation drills where most or all of their workers practiced donning a breathing device during the drill in 2006.¹⁴ However, we estimate that out of those mines, 44 percent did not have their workers practice inserting the mouthpiece. Although the March ETS permitted miners to simulate the insertion of the mouthpiece in training exercises, the final rule in December clarified that actual insertion is required.¹⁵ MSHA requires all miners to practice each step in the process of donning the device, including opening and activating the device and inserting the

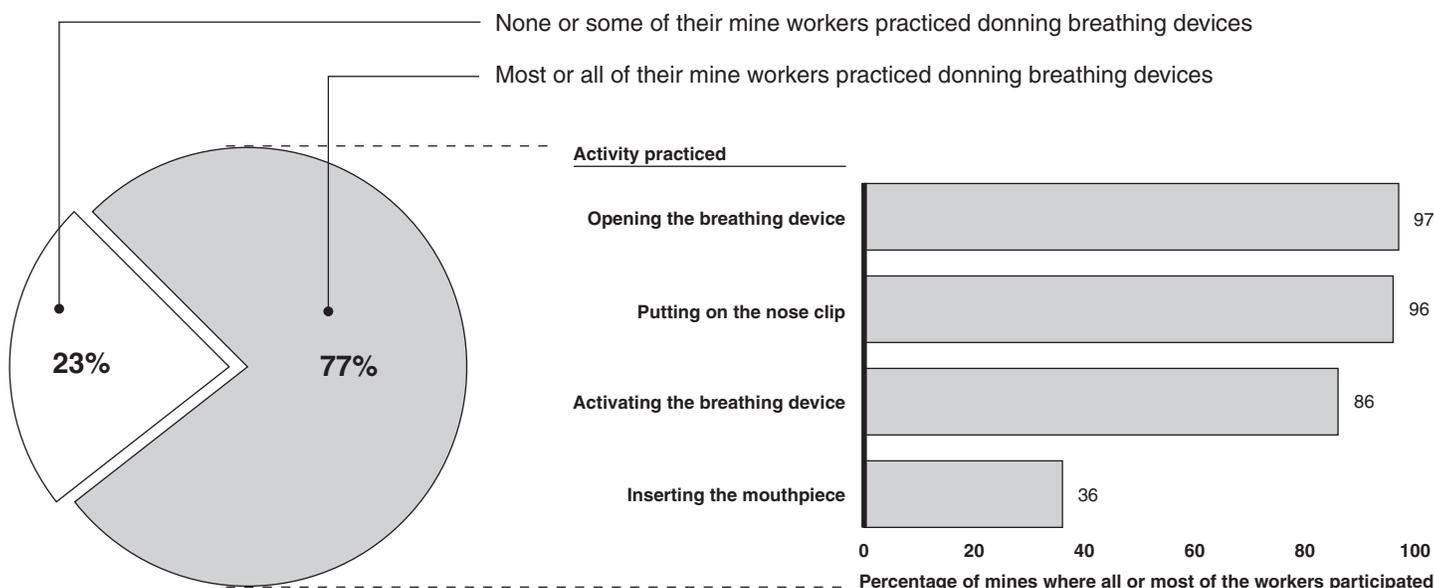
¹³Emergency breathing devices, also known as self-contained self-rescuers (SCSR), are closed-circuit devices containing or producing an independent supply of oxygen, enabling miners to breathe in the presence of hazardous or life-threatening contaminants in the atmosphere.

¹⁴Percentage estimates are based on the sample and are subject to sampling error. We are 95 percent confident that the results we obtained are within plus or minus 8 percentage points of the true values of the in-scope population. Each sample element was subsequently weighted in the analysis to account for all members of the in-scope population, including those that were not selected.

¹⁵MSHA made this change in the final rule because it was concerned that without actually physically inserting the mouthpiece, a miner may not gain the skills to effectively and properly perform this action.

mouthpiece. The purpose of this training is to familiarize miners with the process of operating a breathing device and the sensations of breathing through it, such as resistance when breathing and the heat generated by the unit.¹⁶ However, not all mines have trained miners in all of these steps (see fig. 2).

Figure 2: Estimated Extent of Training Conducted with Breathing Devices at Mines in 2006



Source: GAO analysis of survey data.

Based on our survey, we estimate that of the mines where most or all of the workers practiced donning a breathing device in 2006, only 36 percent practiced inserting the mouthpiece, a result that could be due to miners' reluctance to share used mouthpieces. According to mine safety and training officials, even when the mouthpieces are sterilized between uses, many miners are reluctant to use them because of the fear of infection. In addition, the March ETS and the December regulations require that miners

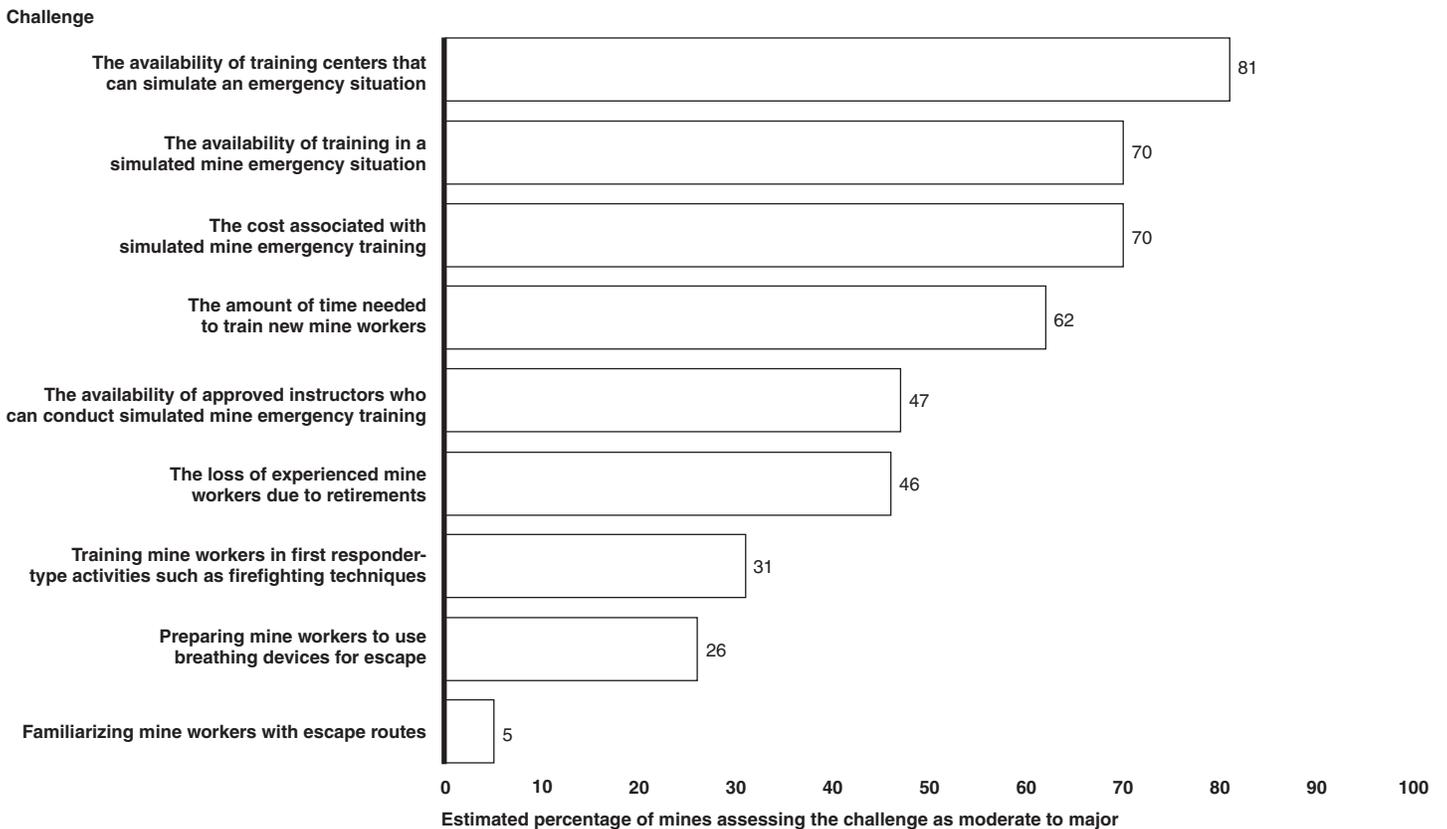
¹⁶Although ETS requirements initially were effective immediately, the final rule issued in December 2006 did not include a required compliance date for training with breathing devices because, according to MSHA, training devices that provided the sensation of airflow resistance and heat were not available for purchase at that time. In March 2007, MSHA published a notice in the *Federal Register* informing mine operators that they must have a purchase order for realistic SCSR training units by April 30, 2007, and that they must conduct training within 60 days of the receipt of the units. See Emergency Mine Evacuation, 72 Fed. Reg. 15,169 (March 30, 2007).

practice switching from one breathing device to another in the event that they have to use more than one device during an emergency, but an estimate of 42 percent of all mines did not conduct such exercises in 2006.

In addition, we estimate that about half of mines had not conducted drills in environments that simulate actual emergency situations, and many cited providing such training as one of the greatest challenges they face in preparing workers for mine emergencies. MSHA's new training requirements direct mine operators to conduct quarterly mine emergency evacuation drills; install directional lifelines to help miners find their way out of a dark mine; and instruct miners in the procedures for evacuating the mine in emergencies, such as those involving fires or explosions.¹⁷ On the basis of our survey, almost all mines conducted evacuation drills and installed lifelines in 2006. However, we estimate that half of the mines had not conducted drills in environments that simulated actual emergency situations. According to our survey, the greatest challenges in preparing miners for and responding to mine emergencies related to simulated mine emergency training. Specifically, the three most commonly reported challenges were the availability of training centers that can simulate an emergency situation, the availability of training in a simulated mine emergency situation, and the cost associated with providing simulated mine emergency training (see fig. 3).

¹⁷To ensure that four major scenarios—fire, explosion, gas, and water inundation—are covered each year, the final rule issued in December requires that a different scenario be used each quarter in conducting evacuation drills.

Figure 3: Mines' Assessment of Challenges in Preparing Workers for Mine Emergencies



Source: GAO analysis of survey data.

Although mine operators recognized the importance of simulated emergency training, many mines faced challenges conducting such training due to their limited access to special facilities and the high cost of such training. We estimate that 81 percent of mines viewed the availability of training in a simulated mine emergency situation as a moderate to major challenge. According to mine training officials and experts, emergency training is best conducted in simulated conditions that are as close to the actual conditions present during an emergency as possible because it builds miners' confidence and enables them to respond appropriately during an actual emergency. The Mine Academy in Beaver, West Virginia, provides some facilities for training under simulated emergency conditions, but it is used primarily for mine rescue training and, according to some mining industry officials, is often not a viable training option because of its limited capacity and distance from many mines. In addition, mine operators can use a mobile training facility developed for various

simulated emergency conditions, but it is not always available, in part because of limitations on instructors' time.¹⁸ The high cost of providing simulated training is another challenge, particularly for smaller mines. On the basis of our survey, we estimated that small mines were less likely to have performed such drills than larger mines.¹⁹ In addition, the cost associated with providing simulated mine emergency training is more of a challenge for small mines than larger mines. According to our survey, small mines were more likely than larger mines to consider the cost of the training to be a major challenge. According to MSHA officials, small mines are less likely than larger mines to employ a full-time safety director who can devote time to developing training under simulated emergency conditions.

Although MSHA has materials that mine operators can use to provide hands-on training on specific topics, it does not provide all mine operators with information and tools for training under simulated emergency conditions. MSHA has a catalog of various training tools, including classroom exercises, which mine operators can obtain upon request. For example, to support the March ETS requirements for training with breathing devices, MSHA distributed a training packet to all underground coal mines and appropriate state grantees.²⁰ However, MSHA does not provide all mine operators with examples of how to provide training in simulated emergency environments such as smoke-filled mines or information on resources available for providing such training. Mine operators use a number of techniques to simulate emergency conditions, but other mine operators may be unaware of them. One mine operator we interviewed reported using a maze in a garage-sized tent filled with artificial smoke to allow workers to safely practice evacuating a smoke-filled mine, and other operators reported using darkened goggles during evacuation drills to simulate the limited visibility miners would experience in a smoke-filled mine. While MSHA has five artificial smoke machines that mine operators may use to help train their workers in evacuating a smoke-

¹⁸In 2006, 15 underground coal mines, mostly in West Virginia and Pennsylvania, used the West Virginia University Mining Extension Service's mobile training facility to provide simulated emergency training to their workers.

¹⁹For purposes of our survey, small mines are defined as those with 36 employees or fewer, whereas larger mines are those with more than 36 employees.

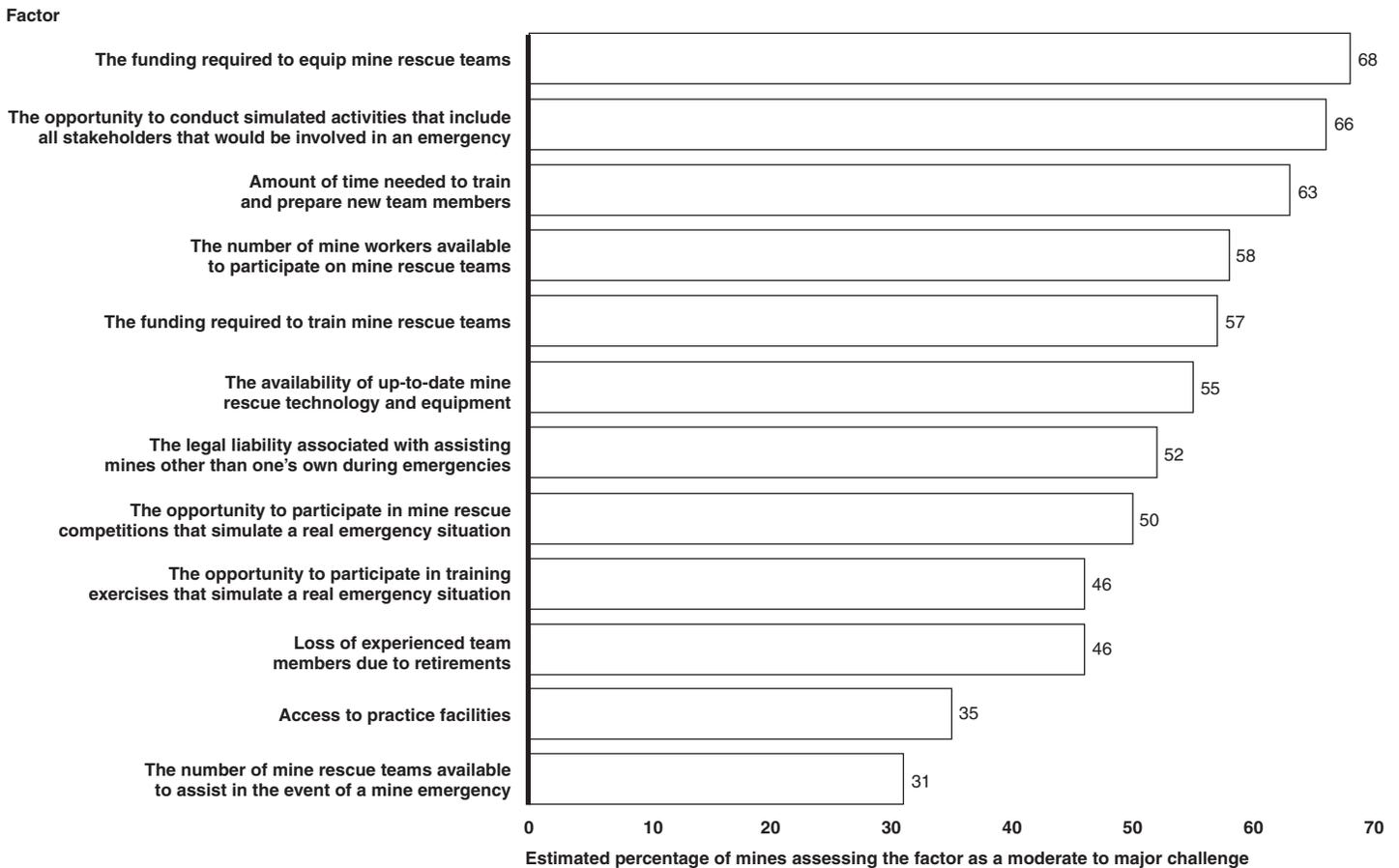
²⁰The packet contained a DVD on the protocol for how to transfer from one breathing device to another, training manuals on six types of breathing devices, an article on how to disinfect the devices, and other related information.

filled environment, many mine operators may not know about them because MSHA does not list them in its catalog of training products or communicate their existence to all mine operators. Based on our survey, we estimate that about half of the mines received no assistance from MSHA in preparing for a mine emergency, such as help developing drills in simulated emergency environments. In addition, several mine operators commented that they viewed MSHA as enforcing safety regulations rather than serving as a resource for developing or providing training.

Mine Operators Face Challenges Funding and Training Rescue Teams and Anticipate Further Challenges Implementing New Requirements

Mine operators reported costs and training as key challenges in preparing rescue teams to respond to mine emergencies, and indicated that implementing new requirements in the MINER Act may exacerbate these challenges. According to our survey, cost concerns and opportunities to conduct simulated training with all stakeholders are the greatest challenges in preparing rescue teams for mine emergencies (see fig. 4).

Figure 4: Mines' Assessment of Rescue Team Challenges in Preparing for Mine Emergencies



Source: GAO analysis of survey data.

An estimate of 68 percent of mines considered the funding required to equip mine rescue teams as a moderate to major challenge in their ability to prepare them for emergencies. For example, mine rescue teams need special breathing devices, gas detectors, and communication equipment. According to a 2006 industry study, the cost of equipping a typical new mine rescue team is over \$90,000, which may be expensive for some mine operators.²¹ In addition, all equipment must be maintained to ensure that it

²¹Bituminous Coal Operators' Association and National Mining Association, *Mine Rescue Handbook: Emergency Response Procedures, Practices and Responsibilities*, January 2007.

is ready to be used, and therefore must be inspected every 30 days, according to MSHA regulations.

Limited opportunity to conduct training in simulated emergency environments with each stakeholder who could be involved in an emergency response effort is a moderate to major challenge for an estimated two-thirds of mines. When a mine emergency occurs, several entities take an active role in the decision-making process that requires quick action and familiarity with the procedures and actions of the other players. For example, the mine command center set up at the beginning of the response to a mine emergency includes officials from the affected mine, a representative of the miners, and MSHA and state officials who are responsible for overseeing the rescue efforts and communicating with the rescue team members underground. In 1995, a panel of mine experts recommended that rescue teams, labor unions, state agencies, and federal agencies join together to participate in mine emergency response exercises. However, MSHA officials told us that while they have developed a process for conducting these exercises, few are carried out at mines each year.²²

The time required to train and prepare new mine rescue team members was also cited as a significant challenge by many mines. We estimate that two-thirds of mines considered the time required to train and prepare new mine rescue team members a major or moderate challenge in implementing the requirements of the MINER Act. Under current regulations, before serving on a mine rescue team, each member must complete 20 hours of instruction in the use and maintenance of the types of breathing apparatus and other equipment used by the team. In addition, mine rescue team members must have at least 40 hours of refresher training each year, which includes, among other things, all team members donning breathing devices for at least 2 hours every 2 months and at least one underground training session every 6 months. Because many mines rely on mine workers to constitute their designated mine rescue teams and because such training can conflict with employees' regular work, some mine operators may feel that it lowers productivity.

²²MSHA's Managerial Emergency Responsiveness Development Program (MERD) utilizes interview and survey feedback techniques, emergency situations and role playing, assessment center methods with feedback, tutorials, and knowledge tests to improve and develop emergency management capabilities. It was designed specifically for MSHA managers, but has been used by other organizations such as individual mines.

In addition to these challenges, mine operators reported that they anticipated further challenges stemming from new requirements in the MINER Act. We estimate that half of underground coal mines anticipate changing the composition of at least one of their designated mine rescue teams as a result of the MINER Act. Of the provisions related to mine rescue, the one that mine operators most anticipated necessitating significant change is the requirement that teams train at least annually in the mines they are responsible for covering. In part, this change is attributed to the way mine rescue services are provided to many mines in several key coal mining states. According to respective state officials, all mines in Kentucky and many in Virginia and Pennsylvania rely on the state to provide or arrange for mine rescue services. In Kentucky, for example, mines receive rescue services from state teams composed of state mine inspectors whose primary duties are to inspect coal mines. According to a state official, a Kentucky team would be required to conduct 120 training exercises annually under the MINER Act, compared to the 12 exercises it currently conducts. Depending on the final regulations developed by MSHA to implement the requirements of the MINER Act, officials in Kentucky said they might stop offering mine rescue services because of the amount of time that will be needed to meet the training requirements outlined in the MINER Act. Similarly, according to state mine safety officials and rescue teams in Virginia, the state will probably have to stop contracting with larger mines to provide rescue team services for many small mines in the state because of the amount of time that teams would be required to train at each mine. According to state mining officials in Pennsylvania, smaller mines would be most affected if the state stops providing rescue teams because, unlike larger mines, they tend not to have their own mine rescue teams.

Some mine operators have started making changes to their mine rescue teams based on the MINER Act, while others are taking a cautious approach, given the costs to train and equip new rescue teams. For example, one company operating multiple mines reported that it was creating new backup mine rescue teams that will satisfy the new 1-hour travel time requirement of the act. In other cases, however, according to mine and industry officials, mines were waiting to see how MSHA implements the new mine rescue requirements before changing their team designations.²³ For example, the extent of the required training at each

²³MSHA has not yet determined how the mine rescue team requirements in the MINER Act will be implemented. MSHA officials said they plan to hold public hearings on the requirements of the act before publishing final rules. The final rule is due December 2007.

mine could affect how mine operators designate rescue teams. According to state mining officials, this requirement might involve the entire team training underground and activating breathing devices at each mine or something less resource-intensive, such as training aboveground at each mine. Some state mining officials and mine operators told us they feared that mines that create new rescue teams will staff them with less experienced people who may not be able to adequately protect miners during an emergency. However, officials with the United Mine Workers of America, the coal miners' union, told us that MSHA should move forward in requiring mines to meet the requirements of the act more quickly, including establishing mine rescue teams at each mine without waiting for the regulations to be finalized. They said they believed that the requirements of the act are clear.

MSHA Reviews Mines' Training Plans and Inspects Training Records but Does Not Adequately Monitor Instructors or Training

MSHA has the authority to oversee certain aspects of miner training to help ensure that miners work safely and are prepared for potential emergencies, but its oversight of training is hindered by several factors, including having inconsistent instructor approval standards. As part of its oversight role, MSHA reviews and approves the training plans that mine operators are required to prepare and inspects training records. As part of its stated mission, MSHA's Educational Field Services office helps develop mine operators' training plans and evaluates instructors and training programs. Educational Field Services staff also provide input to district managers who are responsible for approving new instructors.

MSHA has general guidelines for items to be considered when approving new instructors, but allows districts to determine an instructor's qualifications in different ways. To become an approved instructor, MSHA requires that an applicant prove his or her mining and teaching experience in one of three ways: by (1) submitting written qualifications, (2) attending new instructor training, or (3) teaching a class monitored by MSHA under provisional approval from an MSHA district manager. MSHA suggests factors that district managers may use in determining an applicant's skills, but it does not have firm criteria that new instructors must meet. For example, to assess an applicant's mining qualifications, the district manager may consider, among other factors, the applicant's work experience, state certifications, and completion of MSHA courses. To assess an applicant's teaching skills, a district manager may consider prior teaching experiences and evaluations from teaching sessions at MSHA's instructor training course. In addition, approval procedures are not standardized across MSHA's 11 coal districts, according to MSHA officials. For example, some districts grant provisional approval whereby

individuals are allowed to teach specific courses subject to subsequent approval based on MSHA's monitoring of their teaching skills. However, according to MSHA officials, some of these districts may not monitor these instructors' teaching skills. In other districts, provisional authority is only granted to new instructors if they can be monitored by MSHA staff. According to MSHA officials, staff resources limit districts' ability to monitor applicants' teaching skills.

Another factor that hampers MSHA's ability to monitor training is the fact that it does not have current information on all of its instructors. MSHA maintains a database of approved instructors that includes contact information for each instructor, the courses they are approved to teach, and whether they have full or provisional authority to teach the courses. But according to MSHA officials, the database contains outdated contact information because some instructors move without notifying MSHA. Without accurate information on its instructors, MSHA cannot ensure that instructors receive training policy updates and cannot determine whether there are enough qualified instructors to meet mine operators' needs.

In addition, MSHA does not have continuing education requirements for its instructors. Once instructors are approved, according to an MSHA official, they are not required to demonstrate that they are staying current on emerging mining issues. As a result, MSHA cannot ensure that instructors are keeping their mining knowledge and skills up to date, including their knowledge of emerging safety and health issues and new training tools. For example, although MSHA did send its new training guides on transferring and donning emergency breathing devices to all underground coal mines, it did not send them to the instructors who conduct the training.

MSHA also does not adequately monitor instructors or evaluate training sessions and does not assess whether miners are learning what is being taught in training sessions. According to MSHA guidance, Educational Field Services and district inspection staff should monitor as many training sessions as resources permit. MSHA's guidance includes an instructor evaluation form and a list of steps that staff should take in monitoring instructors, but according to MSHA officials, the agency monitors few miner training sessions relative to the number conducted. According to mine operators and trainers, MSHA rarely oversees training and monitors sessions primarily for enforcement purposes rather than in an attempt to enhance instructors' knowledge and abilities. According to MSHA officials, instructor evaluations occur on an ad hoc basis by MSHA inspectors who happen to be present or by Educational Field Services

staff who attend in response to a specific request. In addition, many of the training sessions occur on the weekends, when MSHA staff do not work, limiting their ability to monitor training. MSHA does not collect or analyze training evaluations obtained from miners to help gauge whether learning objectives are taught effectively, and an estimate of 80 percent of mines do not elicit feedback on training sessions from their workers. Because MSHA does not regularly monitor training and because most mines do not elicit feedback, MSHA cannot determine how well miners are learning the skills taught by MSHA-approved trainers and recommend corrective measures as necessary.

MSHA and NIOSH Lack a Formal Agreement to Guide Mine Safety Coordination

MSHA and NIOSH have a common mission to improve the safety and health of coal miners, but do not have a formal agreement, such as a memorandum of understanding, to guide agencywide coordination efforts or formally involve each other in their strategic planning efforts. As a result, coordination between the two agencies is largely informal and inconsistent. Most of the coordination that occurs is initiated by individual staff members or by outside parties, such as labor unions. Such informal coordination may not be sufficient given the pending retirements of engineers and scientists and other challenges that both agencies face.

Despite Complementary Roles, Coordination between MSHA and NIOSH Is Primarily Staff-Initiated and Inconsistent

MSHA and NIOSH have complementary roles in improving the safety and health of coal miners, but coordination between the two agencies is largely informal and inconsistent due to a lack of a formal agreement or policies to guide their efforts. MSHA is primarily involved in setting health and safety standards and enforcing them through mine inspections that can result in citations and penalties, whereas NIOSH's mining program is focused on research into the causes of and ways to prevent the safety and health hazards miners face.²⁴ While MSHA and NIOSH have different functions, their roles are complementary in a number of respects. Both are involved in providing training and technical assistance for mine inspectors and operators. For example, officials told us that NIOSH researchers help develop training modules and products on a variety of safety and health topics that MSHA makes available to mine operators and inspectors

²⁴According to a top NIOSH official, most of NIOSH's mining program activities now fall under the Office of Mine Safety and Health, a new office established by the MINER Act. According to this official, the office primarily makes permanent a more informal structure that existed in NIOSH for mining research and expands NIOSH's focus on safety technology development.

through the Mine Academy. In addition, NIOSH may recommend that MSHA issue new safety and health standards based on research findings.

Further, MSHA and NIOSH are both responsible for getting new safety technology into the mines. After determining a need for a new safety technology, NIOSH either works directly with manufacturers to develop a new product or to adapt one used in another industry to the mining environment, or develops a market-ready technology and encourages manufacturers to produce it on a larger scale. For certain kinds of mining products, the manufacturer must get MSHA's approval before the technology can be used in mines. Before approving it, MSHA's technical experts evaluate and test products to ensure that they will not cause a fire or explode in an underground coal environment. See table 1 for an illustration of MSHA's and NIOSH's complementary roles.

Table 1: MSHA’s and NIOSH’s Complementary Roles

MSHA’s key activities	NIOSH’s key activities
Inspect mines and investigate mine accidents and complaints	
Develop mandatory safety and health standards	Enumerate hazards in the workplace Identify the causes of work-related diseases and injuries Create ways to control hazards Recommend occupational safety and health standards
Assess and collect penalties for violations of mine safety and health standards	
Review for approval mine operators’ health and safety training plans	
Maintain Mine Academy to train MSHA personnel, including inspectors, and others	Train safety and health professionals
Approve and certify certain products for use in underground coal mines to ensure they do not cause a fire or explosion	Evaluate the hazards of new technologies and work practices Research, develop, and test new technologies and equipment designed to enhance mine safety and health
Provide technical assistance to mine operators to meet the requirements of the Mine Act	
Cooperate with states in the development of their mine safety and health programs	
Make grants to states in which mining takes place	
Oversee rescue and recovery operations	

Source: GAO analysis of agency documents.

Given their roles, MSHA and NIOSH have different perspectives that can inform each other’s work. Through inspections, its role in reviewing and approving miner training, and the technical assistance it provides to mine operators, MSHA officials told us the agency has knowledge of the day-to-day workings of a mine that can help inform NIOSH research. MSHA officials also told us that NIOSH, under the Centers for Disease Control and Prevention, has the capacity to conduct longer-term scientific research and benefits from the perspective of the wider occupational safety and health community.

However, MSHA and NIOSH do not have a current formal agreement, such as a memorandum of understanding or other policy, to guide their

coordination efforts, a practice we have identified as effective in prior work.²⁵ In 1978, NIOSH's predecessor in the Bureau of Mines and MSHA had a signed memorandum of understanding that specified how they would coordinate to ensure the full and effective use of the Bureau of Mines' research capabilities and MSHA's resources and assistance to ensure that technology resulting from mine safety research would be used to the fullest extent.²⁶ The memorandum embodied many of the key practices we have identified in prior work that can help federal agencies enhance and sustain their collaborative efforts, such as defining roles and responsibilities and developing joint strategies. For example, the memorandum stated that the Bureau of Mines would provide overall coordination for the mine safety and health research programs, and MSHA would provide advice and assistance on issues such as health and safety standards and participate through the life cycle of research projects. In addition, the two agencies would develop a joint research strategy for short, intermediate, and long-term objectives, as well as hold regular meetings between staff designated as coordinators for both agencies. The agreement was developed following the move of MSHA from the Bureau of Mines into the Department of Labor. However, the memorandum is no longer used, and MSHA officials were unaware of a plan to update the document. (See table 2 for key coordination practices GAO has identified.)

²⁵We have reported that agencies can strengthen their commitment to work collaboratively by articulating their agreements in formal documents, such as a memorandum of understanding, interagency guidance, or an interagency planning document, signed by senior officials in the respective agencies. See GAO, *Results-Oriented Government: Practices That Can Help Enhance and Sustain Collaboration among Federal Agencies*, [GAO-06-15](#), (Washington, D.C.: Oct. 21, 2005).

²⁶This agreement was originally executed between MSHA's predecessor in the Department of Interior, the Mining Enforcement and Safety Administration (MESA) and NIOSH's predecessor, the Division of Mining Research – Health and Safety in the Bureau of Mines in 1976. The agreement was updated in 1978 after MESA was transferred to the Department of Labor and renamed MSHA.

Table 2: Key Practices for Effective Coordination

Define and articulate a common federal outcome or purpose they are seeking to achieve that is consistent with their respective agency goals and missions. Developing such a common outcome takes place over time and requires sustained resources and commitment.

Establish mutually reinforcing or joint strategies to achieve the outcome. Such strategies help align the agencies' activities, core processes, and resources to accomplish the common outcome.

Identify and address needs by leveraging resources (human, information technology, physical, and financial resources). Agencies can obtain additional benefits that would not be available if they were working separately.

Agree upon agency roles and responsibilities. In doing so, agencies can clarify who will do what, organize their joint and individual efforts, and facilitate decision making. Committed leadership from all levels of the organization is also important.

Establish compatible policies, procedures, and other means to operate across agency boundaries. Frequent communication is another means to facilitate working across agency boundaries and prevent misunderstanding.

Develop mechanisms to monitor, evaluate, and report the results of collaborative efforts. Doing so can help key decision makers within the agencies, as well as clients and stakeholders, obtain feedback for improving both policy and operational effectiveness.

Reinforce agency accountability for collaborative efforts through agency plans and reports. Federal programs contributing to the same or similar results should collaborate to ensure that goals expressed in strategic and annual performance plans are consistent and, as appropriate, program efforts are mutually reinforcing^a

Reinforce individual accountability for collaborative efforts through agency performance management systems. Agencies can do so by, for example, holding agency senior executives accountable for collaboration and teamwork across organizational boundaries to help achieve goals.

Source: GAO.

^aThe purpose of the Government Performance and Results Act of 1993 (GPRA) is to establish strategic planning and performance measurements for federal agencies. Under GPRA, federal agencies are required to develop strategic plans, set program goals and measure performance against them, and publicly report on their progress to the President and Congress (Pub. L. 103-62).

In addition, MSHA and NIOSH do not regularly involve each other in their strategic planning efforts, including planning for research, as required by the Government Performance and Results Act.²⁷ NIOSH uses a comprehensive framework to gain input from more than 500 stakeholders on its research agenda, but MSHA officials contend that their agency should have a higher priority among NIOSH's stakeholders for planning its

²⁷When developing strategic plans, GPRA requires agencies to, among other things, solicit and consider the views and suggestions of those entities potentially affected by or interested in such a plan. 5 U.S.C. § 306(d).

research. While mine safety and enforcement is MSHA's primary focus, mine research is only one part of NIOSH's much broader worker safety agenda, which includes preventing and reducing occupational disease, injury, and death in a number of fields such as agriculture, health care, emergency response, and mining. An MSHA headquarters official told us that the agency does not know much about NIOSH's research outside of the few partnerships in which the two agencies are engaged. A top NIOSH official told us that the agency generally does not involve MSHA in planning its research unless doing so could involve a change in regulations. Officials from both agencies told us that when both agencies were under the Bureau of Mines, MSHA had a greater influence on NIOSH's research agenda.

For their part, NIOSH officials expressed a desire for more input into MSHA's rulemaking process. The head of one of NIOSH's research branches suggested that MSHA should allow NIOSH and other key stakeholders, such as the labor unions and the mining industry, to comment on a proposed rule before it is published for public comment in the *Federal Register*.²⁸ He noted that MSHA recently solicited NIOSH's input on the proposed personal dust monitor regulations. Another official expressed concern that MSHA sometimes issues new safety and health regulations or standards without fully considering the research that should be conducted before implementing them, requiring NIOSH to dedicate resources to unplanned research. For example, MSHA issued a stricter regulation for noise levels in the mines to prevent hearing loss in 1999, causing NIOSH to make changes in its staffing and funding to make research into technology to control noise and efforts to educate mine workers a higher priority.

A recent National Academy of Sciences review of NIOSH's hearing loss research program found that the mechanisms through which NIOSH anticipates the early research needs of MSHA and other regulatory partners are not sufficiently consistent and systematic and that there did not seem to be an effective joint planning process for regulatory activities. The academy recommended that the program establish regular means of conferring with its partners to better anticipate their research needs relevant to regulatory decision making. Anticipating research needs is

²⁸In commenting on our draft report, MSHA noted that it believes NIOSH provides input into MSHA's rule-making process through research, peer-reviewed studies, comments on rule-makings, and participation as a valued member in discussions on technical issues during MSHA rule-making panels.

particularly important given that MSHA and NIOSH operate under different time frames.²⁹ MSHA must quickly respond to safety hazards identified in the mines, whereas NIOSH typically requires 3 to 5 years to conduct its research, according to officials from both agencies.³⁰ The 1978 memorandum between NIOSH's predecessor and MSHA provided for such consultation, requiring MSHA to advise the Bureau of Mines of its plan for developing and revising standards in order to allow sufficient opportunity for technical consultation prior to publishing proposed regulations. Similarly, the bureau would advise MSHA of research results that could affect existing or proposed regulations.

As a result of not having a formal agreement or policies to guide their activities, coordination between MSHA and NIOSH is primarily driven by informal relationships between staff at both agencies. Officials from both agencies and labor union representatives told us that coordination has been primarily at the initiative of individuals at both agencies and, as such has not always been consistent across the agencies. For example, some heads of research divisions at MSHA and NIOSH said that the staff from both agencies will contact each other on an informal basis if they have a question or need additional information on a current project. However, other division heads at MSHA reported less frequent communication and a NIOSH official confirmed that some divisions work together better than others.

Communication between MSHA and NIOSH has improved in recent years, in part due to several partnerships, but these efforts are temporary, limited to specific issues, and not part of either agency's standard operating procedures. Further, officials acknowledged that most of these partnerships were initiated by outside parties, such as the mining industry or the labor unions, rather than by the agencies themselves. For example, in 1999 an industry group asked NIOSH to work with MSHA, manufacturers, and a labor union to develop a personal dust monitor, a device miners can wear to monitor in real time the amount of coal dust or other irritants that they are being exposed to as they work. Final testing of the monitors has been completed, but MSHA has not yet proposed new

²⁹In commenting on our draft report, MSHA noted that its rule-making priorities are published in the Department of Labor's semiannual Regulatory Agenda, which provides milestones for MSHA rule-making for the years ahead.

³⁰NIOSH officials told us they can complete a project in less time in the case of an emergency.

changes to the rule requiring mines to use them. In response to the MINER Act, NIOSH and MSHA are involved in another partnership with states, industry and labor groups, and others to develop, evaluate, and implement technology to help workers in mines communicate with personnel on the surface after an accident. The MINER Act requires mine operators to have two-way emergency communications systems within 3 years after passage of the act,³¹ but the harsh underground mine environment makes it difficult to adapt existing communications systems for this purpose. In 2006, Congress provided NIOSH with \$10 million in emergency supplemental funds to be used by the end of fiscal year 2007 to support research to develop mine safety technology, such as communication devices. The funds, which NIOSH is awarding competitively, are targeted to communications and other technologies that could be available for use in mines within 24 to 36 months. These partnerships, while good, have provided only a temporary and limited avenue for coordination between MSHA and NIOSH.

Informal Coordination May Be Insufficient Given Impending Retirements and Other Challenges MSHA and NIOSH Face

NIOSH and MSHA face a potentially large workforce turnover in coming years, and informal coordination based on working relationships between staff members may not continue when the individuals leave. Like many federal agencies, a large proportion of engineers and scientists at MSHA and NIOSH are eligible to retire within the coming years. MSHA provided us with data showing that more than 50 percent of its 140 engineers and scientists will be eligible for retirement within the next 10 years, with 31 percent eligible within 5 years (see table 3).³²

³¹If, however, a mine operator is unable to comply with this requirement, its accident response plan must set forth the alternative means of compliance, which shall approximate, as closely as possible, the degree of functional utility and safety protection provided by a wireless two-way communications device.

³²MSHA faces similar shortages in its inspector workforce in coming years. See GAO, *MSHA's Revised Hiring Process Has Improved the Agency's Recruiting Efforts, But Its Human Capital Strategic Plan Does Not Adequately Project or Address Its Future Workforce Needs*, GAO-07-704R (Washington, D.C.: May 16, 2007).

Table 3: Proportion of MSHA Engineers and Scientists Eligible for Retirement over the Next 10 Years, as of March 2007

Time of eligibility	Number of engineers	Number of scientists
Currently eligible	14	5
Eligible in 5 years	18	6
Eligible in 10 years	24	4
Total eligible within 10 years	56	15
Total workforce	114	26
Percentage eligible within 10 years	49%	58%

Source: MSHA.

Similarly, about half of NIOSH’s employees—most of whom are scientists and engineers—are eligible to retire in the next 5 years. Although current informal coordination may provide researchers with the information they want, new staff replacing those who retire may not continue existing coordination practices without a formal agency policy guiding them to do so.

In addition, MSHA and NIOSH face other challenges that require them to work more closely together, particularly in developing and approving safety technologies. An influx of new and inexperienced miners brought on by the increased demand for coal and the aging of the workforce, rising dangers as miners go deeper underground to mine coal, and recent mine disasters have heightened interest in getting promising new safety technology into the mines quickly. The MINER Act addresses some of these issues, and underscores NIOSH’s and MSHA’s roles in developing and approving safety technologies. For example, the act requires NIOSH to establish a permanent Office of Mine Safety and Health in order to enhance the development of new mine safety technology and speed the use of such technology in the mines, some of which requires MSHA’s approval. The act also requires NIOSH to study the use of refuge chambers for miners that are unable to escape a mine during a disaster and requires MSHA to review the results to determine what actions, such as making regulatory changes, are appropriate in light of NIOSH’s findings. NIOSH and MSHA are now working together to fulfill their responsibilities within

the time frame required by the act.³³ NIOSH also must establish an interagency working group made up of representatives of other federal agencies selected by NIOSH to share technology research and developments that could enhance mine safety and accident response. The group is to recommend technologies for further development to the Director of NIOSH and issue a report on safety technologies and equipment that have been studied, tested, and certified for use in the past year.

Most Penalties Assessed by MSHA Are Paid without Opposition, but Many of Those Appealed Are Reduced Substantially

Most of the penalties proposed by MSHA are paid by mine operators without opposition. However, a small percentage of more serious and higher-dollar penalties are appealed, and many of those appealed are reduced substantially. MSHA uses a standard formula to propose penalties, but the entities involved in the appeals process reported using more subjective methods to assess penalties. MSHA proposes penalties using a standard formula established in its regulations designed to assess higher penalties for more serious violations. However, the entities involved in the appeals process—Labor’s Office of the Solicitor, MSHA’s conference litigation representatives,³⁴ and the Commission’s administrative law judges—recognize that their methods for determining penalty amounts are more subjective than MSHA’s standard formula. As a result, while MSHA’s standard formula and the proposed penalties it calculates using the formula are transparent, it is sometimes more difficult to determine how final penalty amounts were determined through the appeals process.

³³NIOSH is required to report out on its work within 18 months after the enactment of the MINER Act. MSHA then has 180 days after receiving the report from NIOSH to determine what actions it intends to take.

³⁴CLRs are MSHA enforcement staff and are located in every MSHA coal district. They have been provided with specialized legal training and are authorized by the agency to negotiate settlements for penalties that are no higher than \$350 and are limited in legal complexity. The CLRs also oversee conferences requested by mine operators following the issuance of citations to attempt an informal resolution to the disputed violation.

MSHA Uses a Standard Formula to Calculate Penalties, and Recent Changes Are Expected to Increase Them

Through the regulatory process, MSHA has developed a standard formula to calculate proposed civil penalties. In order to determine the amount of a proposed penalty, the agency uses a standard formula that assigns point values to each of the six broad factors outlined in the Mine Act.³⁵ Through this formula, two of the six factors—whether the operator was negligent and the gravity of the violation—carry the greatest weight in deciding the amount of the proposed penalty. MSHA inspectors are responsible for identifying the magnitude of these two elements during their inspections.³⁶ To determine negligence, the inspector must rate the operator's failure to provide adequate care to ensure the safety of miners on a scale from "no negligence" to "reckless disregard." To determine the gravity of the violation, the inspector must determine (1) the likelihood of harm that could come to miners, (2) the severity of any possible or actual injury or illness, and (3) the potential or actual number of miners that could be affected.

After an inspector issues a citation and makes an initial finding regarding the levels of gravity and negligence involved in the violation, MSHA's Office of Assessments determines the magnitude of the remaining four factors and tallies the points for each of the six factors to determine the proposed penalty amount. Because MSHA's standard formula assigns greater points to gravity and negligence than the other four statutory factors, the application of the formula generally results in larger penalties being proposed for violations involving higher levels of gravity and negligence. Between 1996 and 2006, MSHA proposed 506,707 penalties for

³⁵Under regulations effective as of April 23, 2007, MSHA's penalties are assessed in two different penalty categories: regular and special. Prior to the recent regulatory changes, MSHA issued a third type of penalty called the single penalty. The single penalty was a flat \$60 penalty for violations that are unlikely to cause injury or illness. This type of penalty accounted for approximately 60 percent of the penalties issued between 1996 and 2006. MSHA's new regulations eliminate the single penalty. A regular assessment is the agency's general penalty and ranges from \$112 to \$60,000. Special assessments are reserved for violations in which MSHA elects to waive the regular assessment and set another penalty consistent with the six statutory factors. For example, special assessments may be used when an operator fails to correct certain violations or notify MSHA of certain kinds of accidents. A special assessment can be as high as \$220,000, but this is for the new flagrant violation established under the MINER Act; the maximum for most special assessments is also \$60,000. Eligibility guidelines and assessment formulas for special and regular assessments are outlined in MSHA regulations and agency policies.

³⁶MSHA inspectors also determine whether mine operators have made good faith efforts to correct the violation, which results in a 10 percent reduction in the proposed penalty. Under regulations that were in effect through April 22, 2007, the good faith reduction was 30 percent.

safety and health violations, and the average penalty was \$234 per violation. Table 4 details the range of average penalties, by degree of gravity and negligence, proposed by MSHA from 1996 through 2006.

Table 4: Average Proposed Penalty by Gravity and Negligence Indicators, 1996 to 2006

Elements of gravity and negligence	Percentage of citations issued	Average proposed penalty
Gravity of violation^a		
<i>Likelihood of accident</i>		
Accident occurred	0.2%	\$12,324
Highly likely to occur	0.9%	\$2,362
Reasonably likely to occur	38.6%	\$367
Unlikely to occur	55.5%	\$74
No likelihood	2.4%	\$168
Total	97.6%^b	
<i>Potential injury or illness</i>		
Fatal	3.5%	\$1,185
Permanent injury	7.4%	\$569
Lost days	62.4%	\$202
No lost work days	24.4%	\$77
Total	97.7%^b	
<i>Number of miners affected</i>		
0-1 miners	82%	^c
2-5 miners	10.8%	^c
6-9 miners	4.5%	^c
10 or more miners	2.7%	^c
Total	100.0%	
Negligence by mine operator		
Reckless	0.1%	\$8,458
High	3.5%	\$1,757
Moderate	84.3%	\$179
Low	9.4%	\$91
None	0.3%	\$454
Total	97.6%^b	

Source: GAO analysis of data MSHA penalty and violation data.

Note: These data represent the points accumulated under the former assessment process. MSHA expects its new regulations to result in higher proposed penalty amounts for each of these categories.

^aEach subelement of gravity is an exclusive category.

^bPercentage does not add to 100 due to a small amount of missing data.

^cWe did not calculate the average proposed penalty for the number of miners, because most (75 percent) of the violations involved only one miner.

MSHA recently changed its regulations governing civil penalty assessments to update them and increase proposed penalty amounts, and to implement the new civil penalty requirement of the MINER Act. The new regulations increase the points for most of the six statutory factors, and MSHA officials predicted that the new penalty structure will increase total penalty assessments by 234 percent. For example, these changes will increase the maximum points allotted for gravity from 30 to 88 points. MSHA officials asserted that these changes will likely lead to greater rates of compliance and subsequently a safer working environment for the nation's miners. As required by the rule-making process, MSHA conducted an economic analysis to measure the costs and benefits of the new regulations. In its analysis, MSHA estimated that if these changes had been in effect in 2005, the total violations for all mine types would have declined by 20 percent, from 116,673 to 93,422 violations.³⁷ See table 5 for an example of how MSHA would determine the penalty for a certain violation based on the six statutory factors under the previous and new penalty formulas.

³⁷Criteria and Procedures for Proposed Assessment of Civil Penalties; Final Rule, 72 Fed. Reg. 13,592, 13,629 (March 22, 2007) (codified at 30 C.F.R. Part 100).

Table 5: Example of How a Proposed Penalty Amount Could Be Determined Based on the Previous and Revised Standard Penalty Formulas

Statutory factor	Points under previous formula	Points under new formula
Operator's history of previous violations		
Mine had an average of about one violation per inspection day	8	10
Mine had 10 repeat violations in prior 15 months and averaged 0.04 repeat violations per inspection day	^a	5
Operator's size		
Mine produced over 2 million tons of coal per year	10	15
Company owning mine produced over 10 million tons of coal per year	5	10
Negligence		
Moderate	15	20
Gravity		
<i>Likelihood of accident</i>		
Highly likely to occur	7	40
<i>Severity of injury or illness</i>		
Lost work days	3	5
<i>Number of miners affected</i>		
2 miners	2	2
Total points under previous and new formula	50	107
Total penalty under previous and new formula	\$878	\$4,810

Source: GAO analysis of MSHA data.

Note: This example assumes that the penalty will not affect the operator's ability to remain in business, and therefore does not account for a reduction for this factor. In addition, this example assumes the mine operator does not get a good faith reduction in the penalty.

^aMSHA's new regulations added this as an additional element of the factor for the operator's history of previous violations.

Many Contested Penalties Are Reduced Substantially Regardless of the Gravity of the Violation and the Degree of the Operator's Negligence

Many of the proposed penalties contested by mine operators are reduced substantially through the appeals process, despite the initially determined gravity of the violation and the initially determined degree of the operator's negligence contributing to the violation. Between 1996 and 2006, approximately 6 percent (31,589) of the penalties proposed by MSHA for violations of underground coal mine safety and health standards were contested by mine operators. Our analysis of MSHA's penalty data showed that over the last 10 years, the amounts of the proposed penalties

contested by mine operators were typically much larger than those not contested and involved more serious health and safety violations. For example, the average amount of a contested penalty was \$1,107, compared to an average of \$176 for a noncontested penalty, and more than half of all contested penalties were for the most serious violations.³⁸

Almost half of all penalties contested by underground coal mine operators are reduced through the appeals process, even those involving the highest levels of gravity and negligence. From 1996 to 2006, 47 percent of all contested penalties (14,723 penalties) were decreased from the amount originally proposed by MSHA. On average, these penalties were reduced by about half of the amount initially proposed by MSHA using its standard formula. In addition, regardless of the levels of gravity and negligence found by MSHA's inspectors, penalties were reduced, on average, between 47 percent and 66 percent. Proposed penalties assessed by MSHA based on the highest and lowest levels of gravity and negligence found by MSHA inspectors were reduced by the greatest amounts (see table 6).

³⁸Sixty-three percent of contested penalties are considered "significant and substantial," or "S&S," violations. An inspector designates violations as S&S if they are deemed at least reasonably likely to cause an injury that results in lost work days. This designation can trigger more serious sanctions, such as closing a portion of a mine or closing an entire mine.

Table 6: Contested Penalty Reductions by Gravity and Negligence Indicators, 1996 to 2006

Elements of gravity and negligence^a	Percentage of contested penalties that were reduced	Average percentage reduction
Gravity of violation		
<i>Likelihood of accident^b</i>		
Accident occurred	63.5%	59%
Highly likely to occur	65.5%	49%
Reasonably likely to occur	51.3%	47%
Unlikely to occur	32.4%	54%
No likelihood	45.7%	66%
<i>Potential injury or illness^b</i>		
Fatal	59.4%	52%
Permanent injury	57.4%	47%
Lost days	46.5%	48%
No lost work days	31.2%	57%
<i>Number of miners affected^b</i>		
0-1 miners	c	c
2-9 miners	c	c
10 or more miners	c	c
Negligence by mine operator^b		
Reckless	68.8%	55%
High	61.4%	50%
Moderate	43.6%	48%
Low	50.9%	49%
None	55.8%	57%

Source: GAO analysis of MSHA data.

^aInitial penalty proposals are based on the findings from mine inspections and are calculated using MSHA's standard formula. The entities involved in the appeals process may have altered the inspectors' findings, which could lead to a reduction in the penalty amount.

^bPercentages may not add to 100 due to rounding or a small amount of missing data.

^cWe did not calculate the average proposed penalty for the number of miners, because most (75 percent) of the violations involved only one miner.

Entities Involved in the Appeals Process Apply the Statutory Factors to Determine Penalty Amounts, but Exercise Considerable Discretion

While all of the entities involved in the appeals process—Labor’s Solicitor’s Office, MSHA’s CLRs, and the Commission’s ALJs—are required by law to apply the six statutory factors specified in the Mine Act, they are not legally obligated to use any particular method to set a final penalty amount when they determine that a reduction from MSHA’s proposed penalty is appropriate. As a result, they have considerable discretion in deciding on the final penalty amount. Prior decisions by the Commission require ALJ decisions to be sufficiently explained.³⁹ However, in some cases we reviewed, while the reasons supporting a reduction from MSHA’s proposed penalty are clearly explained, the rationale for the final penalty amount is not always well documented.

Officials from all three of the entities involved in the appeals process told us that, in determining the size of a final penalty, they apply the six statutory factors on a case-by-case basis and use their professional judgment. For example, officials from the Solicitor’s Office and CLRs told us that, when appropriate, the Department of Labor generally views penalty settlements as being in the best interest of both the agency and the mine operators because settlements allow them to avoid costly litigation.⁴⁰ Attorneys from the Solicitor’s Office also told us that they analyze the evidence presented by MSHA inspectors and mine operators and assess their chances of winning the case in deciding whether to settle a penalty or go to trial. For example, one attorney told us that many of the penalty amounts contained in settlement agreements are generally the result of negotiations between the Solicitor’s Office and the mine operator. In commenting on a draft of this report, MSHA and the Solicitor’s Office said that CLRs and attorneys may concede somewhat on the penalty amount in

³⁹In August 2006, the Commission reminded ALJs of the importance of adequately documenting penalty decisions. Specifically, the Commission wrote “When . . . it is determined that penalties are appropriate which substantially diverge from those originally proposed, it behooves the Commission and its judges to provide a sufficient explanation of the bases underlying the penalties assessed by the Commission. If a sufficient explanation for the divergence is not provided, the credibility of the administrative scheme providing for the increase or lowering of penalties after contest may be jeopardized by an appearance of arbitrariness.” *Jim Walter Resources, Inc.*, 28 FMSHRC 579, 606-07 (August 2006) (citing *Sellersburg Stone Co.*, 5 FMSHRC 287, 293 (March 1983)).

⁴⁰In addition to the general costs of litigation, in some cases, the Equal Access to Justice Act requires that the Department of Labor pay a mine operator’s fees and expenses, including reasonable attorneys’ fees, if the ALJ finds that the agency’s position was not substantially justified, such as when an MSHA-proposed penalty is lowered significantly in formal proceedings. 5 U.S.C. § 504 and 29 C.F.R. Part 2704.

some settlement cases as long as future compliance with the standard, or another valid enforcement objective, is agreed to by the mine operator.

Labor officials told us that, when the CLR program was created, CLRs were expected to handle approximately 30 percent of all contested cases. However, our analysis of the CLRs' caseloads indicated that, as of January 2006, they were assigned only 14 percent of all open cases contested by mine operators. According to the CLRs, they generally take a similar approach to that taken by attorneys with the Labor Solicitor's Office in negotiating settlements. Both CLRs and Solicitor's Office staff told us that they are encouraged to use MSHA's standard formula to assess penalty amounts but using the formula is not required and is not standard practice. When the Solicitor's Office or a CLR is unable to negotiate a settlement or determines that it would not be appropriate to settle, the case goes to trial and an ALJ determines the final penalty amount. Several ALJs told us that they review the evidence provided by MSHA but the process for determining the final penalty amount relies greatly on their experience and expertise.

In general, while the reasons supporting a reduction from MSHA's proposed penalty are clearly explained in ALJ decisions, the rationale for the final penalty amount is not always well documented. For example, in one case decided in October 2005, the ALJ reduced MSHA's proposed penalty from \$50,000 to \$10,000.⁴¹ Although the judge concluded that the gravity of the violation was less than MSHA had originally found, thereby supporting a penalty reduction, he appeared to agree with MSHA's assessment regarding the other five statutory factors, including MSHA's finding that the operator's degree of negligence was high.⁴²

Conclusions

The risky conditions in underground coal mines were brought to the nation's attention early in 2006, and the sad consequences have become a reality for many Americans. As MSHA embarks on the reforms outlined in the MINER Act and other internal efforts to improve the safety of mines, it faces hurdles that will need to be overcome in order to assist the mining industry as it bears the daily responsibility for the safety and health of America's miners. The mining industry is changing: production continues

⁴¹*Wabash Mine Holding Co.*, 27 FMSHRC 672 (October 2005).

⁴²See also *Jim Walter Resources, Inc.*, 28 FMSHRC 1068 (December 2006) and *Jim Walter Resources, Inc.*, 28 FMSRC 579 (August 2006).

to increase, technologies are evolving, and new workers are entering the mines to replace their experienced colleagues who are retiring. These changes call for a greater attention to safety from all entities involved—federal and state officials, mine operators, miners, and their representatives. Without adequate training, including practice using safety devices in simulated emergency conditions, miners may be unable to safely and confidently escape a mine. Further, absent adequate monitoring of instructors who provide this training, MSHA cannot determine whether all of its instructors are properly qualified or whether it has enough instructors to meet its needs. Perhaps most important, MSHA is unable to determine whether miners receive timely and appropriate training.

The social, economic, and technological changes in the mining industry present challenges that will be difficult, if not impossible, for MSHA to address alone. MSHA and NIOSH have complementary roles, particularly in developing and approving technologies to help improve mine safety, and face similar challenges such as high rates of retirements. Yet, without having a more structured method of coordination, their shared knowledge base and research cannot be used to effectively speed the implementation of new safety technology in mines.

Finally, given the trends over the past 10 years for penalties contested by mine operators, the higher proposed penalties under MSHA's new penalty structure will likely lead more operators to appeal. This reaction is also likely to increase the number of cases that are settled by Labor's Solicitor's Office, MSHA's CLRs, and the ALJs at the Commission using methods to determine final penalty amounts that are more subjective than penalties proposed using MSHA's standard formula. As a result, it is important that penalty decisions are transparent and contain the necessary information to understand how final penalty amounts are set. Without such information, it will be difficult to monitor their decisions over time to ensure that all of the entities involved in the appeals process are appropriately and consistently applying the six statutory factors in altering penalty amounts and that the impact of penalties in protecting miners' safety through greater compliance by mine operators is not diminished.

Recommendations for Executive Action

To help mines train their workers under simulated emergency conditions, the Secretary of Labor should direct MSHA to publicize information and available tools for training mine workers under such conditions. In addition, MSHA should periodically review and update this information, as appropriate.

To help ensure that mine workers are adequately prepared for emergencies, MSHA should strengthen its monitoring of training. This monitoring should include

- reviewing and standardizing districts' procedures for approving new instructors;
- establishing continuing education requirements for instructors to help instructors maintain or improve their knowledge and skills;
- improving the data in its records on approved instructors; and
- developing a process for monitoring miner training that includes regularly evaluating training sessions, assessing how well learning objectives are being met, and providing feedback to instructors.

To improve the effectiveness of information sharing between MSHA and NIOSH, we recommend that the Secretaries of Labor and Health and Human Services direct their respective agencies to work together to establish a formal memorandum of understanding to guide their coordination. In addition, the agencies should periodically review and update the memorandum, as appropriate.

In order to ensure that there is transparency in penalty determinations, we recommend that the Department of Labor's Office of the Solicitor, MSHA, and the Commission take steps to ensure that the specific rationale for all final penalty amounts, including reductions from MSHA's proposed penalties, are adequately documented.

Agency Comments

We obtained comments on a draft of this report from MSHA, the Department of Labor's Office of the Solicitor, the Department of Health and Human Services, and the Federal Mine Safety and Health Review Commission. Their comments are reproduced in appendixes III, IV, and V. MSHA and the Solicitor also provided technical clarifications, which we incorporated as appropriate.

MSHA, the Office of the Solicitor, the Department of Health and Human Services, and the Federal Mine Safety and Health Review Commission agreed with the recommendations addressed to each of their organizations. In addition, MSHA noted actions it has either begun or plans to take in implementing the recommendations. We commend MSHA for starting work to improve its oversight of the safety of underground coal mines.

In response to our recommendation that MSHA publicize and periodically update information on training mine workers under simulated emergency conditions, MSHA agreed, and stated that it will develop a Web page for this purpose and will issue an information bulletin to mine operators about this Web-based resource. To provide mine operators with additional options, MSHA noted that it has asked NIOSH to examine methods of providing simulated emergency training and to consider the cost of these methods.

In response to our recommendation that MSHA strengthen its monitoring of miner training, MSHA generally agreed and indicated that it will develop and implement standardized procedures for approving new instructors. In addition, it will develop an instructor evaluation plan to use in determining the effectiveness of training provided to miners. Regarding establishing continuing education requirements for approved instructors, MSHA indicated that it has asked NIOSH to review the effectiveness of such requirements. MSHA noted that this action may require regulatory changes. MSHA also explained that there are other avenues that instructors can use to stay current on mining issues, such as attending an annual conference dedicated to training resources for the industry. MSHA also recognized the need to improve the data it maintains on instructors and noted that it has plans to improve its tracking and dissemination of up-to-date information on approved instructors.

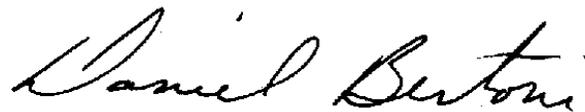
In response to our recommendation that MSHA and NIOSH develop a memorandum of understanding, both agencies concurred with the need for a formal agreement and stated that such an agreement will help strengthen their coordination activities. MSHA noted that both agencies started the process of developing a memorandum of understanding in 2002 and stated that it will work with NIOSH to revitalize this effort and complete the process.

MSHA, Labor's Office of the Solicitor, and the Commission agreed with our recommendation for improving the penalty appeals process. Each of them agreed that there needs to be transparency in penalty determinations and that the specific rationale need to be provided when penalties are reduced from the levels originally proposed. MSHA and the Solicitor agree that transparency is essential to ensure public confidence that the purposes of the Mine Act are fulfilled and that administration of the Mine Act is fair. They commented that they would formally remind CLR's and attorneys to ensure that the rationale for each civil penalty agreement is adequately documented in settlement agreements and case file notes. They

also commented that internal audits of the CLR program have emphasized the need for adequate documentation to support settlement agreements.

In respect to our characterization of the Washbash Mine Holding Co. case, the Commission disagreed with GAO's conclusions. We agree with the Commission that the reasons supporting the reduction are clearly explained. However, we continue to believe that the rationale for the final penalty amount was not well documented. In our analysis, we could not discern the specific reasons why the judge determined that \$10,000 was the appropriate fine.

We are sending copies of this report to the Secretaries of Labor and Health and Human Services, the Chief Commissioner of the Federal Mine Safety and Health Review Commission, relevant congressional committees, and other interested parties. Copies will be made available to others upon request. In addition, the report will be available at no charge on GAO's Web site at <http://www.gao.gov>. Please contact me at (202) 512-7215 if you or your staff have any questions about this report. Other major contributors to this report are listed in appendix VI.



Daniel Bertoni
Director, Education, Workforce,
and Income Security Issues

List of Congressional Requesters

The Honorable Robert C. Byrd
Chairman
Committee on Appropriations
U. S. Senate

The Honorable Edward M. Kennedy
Chairman
The Honorable Michael B. Enzi
Ranking Member
Committee on Health, Education, Labor, and Pensions
U. S. Senate

The Honorable Tom Harkin
Chairman
The Honorable Arlen Specter
Ranking Member
Subcommittee on Labor, Health and Human Services, Education and
Related Agencies
Committee on Appropriations
U. S. Senate

The Honorable Patty Murray
Chair
The Honorable Johnny Isakson
Ranking Member
Subcommittee on Employment and Workplace Safety
Committee on Health, Education, Labor, and Pensions
U. S. Senate

The Honorable George Miller
Chairman
Committee on Education and Labor
House of Representatives

The Honorable John D. Rockefeller IV
U. S. Senate

The Honorable Shelley Moore Capito
House of Representatives

The Honorable Alan B. Mollohan
House of Representatives

The Honorable Nick Rahall
House of Representatives

Appendix I: Scope and Methodology

To conduct this work, we reviewed relevant statutes, regulations, policy documents, decisions issued by the Commission and its administrative law judges (ALJ), and other materials. We spoke with Mine Safety and Health Administration (MSHA) officials in 6 of the 11 districts, including inspectors, conference litigation representatives (CLR), and district managers; and officials from the headquarters office, the National Mine Health and Safety Academy, Educational Policy and Development, the Educational Field Services, and certified trainers. We met with representatives from the Office of the Solicitor, including officials in the headquarters and regional offices, and interviewed the Chairman of the Federal Mine Safety and Health Review Commission, its Chief ALJ, and other Commission officials. Finally, we spoke with officials from universities, a technology manufacturer, the United Mine Workers of America, the National Mining Association, and the Joseph A. Holmes Safety Association.

We visited three states to obtain more detailed and qualitative information regarding the experiences of state mine safety agencies, mine operators, and MSHA district offices in our research objectives. We conducted visits in Kentucky, Virginia, and West Virginia. In Kentucky, we met with state and MSHA district officials. In addition, we observed a mine rescue competition where we conducted interviews with mine rescue team members. In Virginia and West Virginia, we met with state and MSHA district officials. In addition, we visited three underground coal mines to observe mining operations and to talk with mine managers, mine rescue team members, and mine workers. We also spoke with state officials in Pennsylvania. These four states contain almost 90 percent of all underground coal mines in the United States. Finally, we met with researchers and other officials at the technical research centers operated by MSHA and the National Institute of Occupational Safety and Health (NIOSH).

Survey of Underground Coal Mines

Study Population and Sampling Design

To determine the current state of underground coal mines' operations and challenges in preparing for and responding to mine emergencies, we surveyed a stratified random probability sample of 342 underground coal mines from a study population of 665 underground coal mines identified by MSHA as being active at the end of calendar year 2005. We selected our

sample by five strata defined by the number of mine employees and the number of mines under the responsibility of a single contact. We included the last stratum in an attempt to ease the burden on the survey respondents. Close to 40 percent of the mines selected in the sample were out of scope for analysis due to closure by the time our survey fieldwork ended. Information on the coal mine population, the sample selected, out-of-scope mines, and the respondents across the five strata can be found in table 7. Ultimately, we received 146 completed, in-scope surveys, for an adjusted response rate of 69 percent.

Table 7: Sample Disposition for Survey of Underground Coal Mines

Stratum number	Stratum description	Total population size	Total sample size	Number in sample that were out of scope	Number of respondents	Adjusted response rate for in-scope mines (percent)
1	Mine employs between 1 and 16 workers	180	88	48	26	65
2	Mine employs between 17 and 36 workers	152	82	38	30	68
3	Mine employs between 37 and 199 workers	147	78	25	36	68
4	Mine employs 200 or more workers	49	49	6	34	79
5	Mine shares contact point with at least four other mines	137	45	16	20	69
Total		665	342	133	146	69^a

Source: GAO analysis of MSHA data.

^aTotal adjusted response rate is an average based on each stratum's response rate weighted by its in-scope population.

Survey Development

To inform the design of the survey questions, we consulted with mine officials, industry and labor organizations, and federal and state officials. In addition, we used documents and research about miner training and mine rescue. Finally, we referred to the recent mine evacuation regulations developed by MSHA and the Mine Improvement and New Emergency Response Act of 2006 to ensure we were collecting timely information on the operations at underground coal mines. A copy of the survey questionnaire can be found in appendix II.

To verify the clarity, length of time of administration, and suitability of the questions, we pretested the questionnaire with mine safety officials at

three mines. We revised the instrument based on the results of the pretests and the feedback we received.

Administration of the Survey

We used a self-administered mail-out questionnaire that was in the field between November 2006 and February 2007. We conducted several follow-up efforts to encourage a higher response rate: a reminder letter, a second mailing that included another copy of the questionnaire, and two efforts to contact nonrespondents by telephone. We ended data collection in February 2007.

Nonsampling Error and Data Quality

The practical difficulties of conducting any survey may introduce errors, commonly referred to as nonsampling errors. For example, difficulties such as how a particular question was interpreted or in the sources of information that are available to respondents can introduce unwanted variability into the survey results. We took steps in the development of the questionnaire, the data collection, and the data analysis to minimize these nonsampling errors.

In addition to pretesting the questionnaire with relevant individuals to ensure questions were interpreted in a consistent manner, we edited all the surveys for consistency before they were sent for keypunching. All questionnaire responses were entered into our database and a random sample of the questionnaires was further verified for completeness and accuracy. In addition to the steps taken during the development of the survey and its administration, we performed computer analyses to identify inconsistencies and other indicators of errors. We established parameters for addressing inconsistent responses that included calling the respondent for clarification or treating the data as missing. In addition, all the computer syntax was peer-reviewed and verified by separate programmers to ensure that it was written and executed correctly.

Estimates

Estimates in this report are for the population of underground coal mines in the United States that were in operation at the end of 2005 and remained open during the course of the survey. Due to mine closure, some mines are not represented in these results. We found that smaller mines were more likely to have ceased operation than larger mines. Therefore, it is possible that different safety practices and challenges may exist for mines that closed.

Sampling Errors

The results of random samples like ours are subject to sampling errors that reflect the differences between the results obtained from the samples and the results that would have been obtained from a survey of the entire population under consideration. Because we surveyed a sample of underground coal mines, our results are estimates of the characteristics of this population and thus are subject to the sampling errors associated with samples of this size and type.

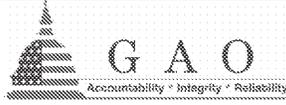
Measurements of sampling errors are stated at a certain level of statistical confidence. GAO used the weighted results to make estimates about the entire population of underground coal mines. Our confidence in the precision of the results from this sample is expressed in 95 percent confidence intervals, which are intervals that are expected to contain the actual population values for 95 percent of the samples we could have drawn. As a result, we are 95 percent confident that each of the confidence intervals in this report will include the true values in the in-scope population. All percentage estimates for our sample have margins of error—widths of confidence intervals—of plus or minus 8 percentage points or less, at the 95 percent confidence level.

Citation and Penalty Data

To determine the average of proposed penalty amounts, the number of penalties contested, and the amount of the final penalties assessed on mine operators, as well as other violation information, we obtained data from the Mine Safety and Health Administration. We used data maintained in the MSHA Standardized Information System (MSIS). The data represent violations issued to mine operators and the associated actions taken on those violations (such as the proposed penalty, if the operator contested the violation, and if the final penalty was reduced) between January 1996 and October 2006.

To assess the reliability of the data, we (1) performed electronic testing of the relevant data elements, (2) reviewed related documentation, and (3) interviewed and worked closely with officials knowledgeable about the data. We determined that the data were sufficiently reliable for the purposes of this report.

Appendix II: Survey of Underground Coal Mines



United States Government Accountability Office

Survey of Underground Coal Mines

Introduction

The U.S. Government Accountability Office (GAO)—the research arm of Congress—is conducting a survey of underground coal mines. Your responses will provide GAO with the necessary information to inform Congress about the current state of mines’ operations and the challenges mines face in preparing for and responding to mine emergencies. In addition, we will report to Congress on mines’ abilities to respond to new requirements set out in the *Emergency Temporary Standard* issued by the Mine Safety and Health Administration (MSHA) and the *Mine Improvement and New Emergency Response Act of 2006* (MINER Act).

This survey is not affiliated with requests for information from MSHA or any other efforts MSHA is conducting to implement the MINER Act or other regulatory changes.

We ask that you provide responses for the mine identified by the MSHA Mine ID # below. This mine was selected as part of a random sample of underground coal mines in the U.S.

Responses will be reported in the aggregate only and will not be attributed to any specific mine in our report. To assist us, we ask that you complete and return the survey within one week of the date you receive it. When responding, you may wish to consult with others who are familiar with these topics, such as mine rescue team coordinators.

In the event the envelope is misplaced, the return address is: U.S. Government Accountability Office, P.O. Box 50654, Washington, DC 20077-0075; Attention: Delores Hemsley. If you have any questions about this questionnaire, please call or e-mail Joel Green at (415) 904-2148 (GreenJ@gao.gov) or Sara Schibanoff at (202) 512-4176 (SchibanoffS@gao.gov).

Thank you for your assistance.

Contact Information

Please provide the following information for the individual coordinating the completion of this survey so that we may contact him/her to clarify any responses, or obtain additional information, if necessary.

Name: _____

Title: _____

Mine Name: _____

Telephone Number: () - _____

Email address: _____ @ _____

MSHA Mine ID # _____

Mine Workers

1. How many employees and contractors are currently employed at your mine? Include full- and part-time workers in your counts.

_____ Employees

_____ Contractors

2. Typically, how many mine workers are underground per shift?

_____ workers per shift

3. Does your mine currently use the practice of “hot seating” at the change of shifts when mine workers from overlapping shifts are underground at the same time?

Yes.....

No

4. A. In calendar year 2006, has your mine conducted mine emergency evacuation drills with your mine workers?

Yes..... →

No..... (please skip to question 10)

B. If yes, how many emergency evacuation drills have you conducted?

_____ Emergency evacuation drills

C. When was the most recent evacuation drill conducted?

_____/_____(Month/day)

D. Was an MSHA representative present at any of the emergency evacuation drills conducted in calendar year 2006?

Yes

No.....

Do not know.....

5. How was the *most recent* evacuation drill conducted?

Please select one

Mine workers exited the mine riding on the man trip.....

Mine workers exited the mine on foot

Mine workers used a combination of riding on the man trip and walking to exit the mine on foot

Other, please describe below:

6. During the evacuation drills conducted in calendar year 2006, how many mine workers practiced donning their self contained self rescuers (SCSRs)?

- None of them..... → *Please skip to question 10*
 Some of the them
 Most of the them
 All of the them

7. In calendar year 2006, how many mine workers performed the following activities during exercises with SCSRs?

	None of them ▼	Some of them ▼	Most of them ▼	All of them ▼
a. Opening the unit.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Donning nose clips.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Inserting the mouthpiece.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Starting the device	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Operating the device	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Other, please describe below:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11. In calendar year 2006, has your mine conducted an exercise in which your mine workers practiced taking off one SCSR and donning another SCSR of the same model?

Yes.....
No.....

→ If yes, please describe how this training was conducted:

12. In calendar year 2006, has your mine conducted an exercise in which your mine workers practiced taking off one SCSR and donning another SCSR of a different model?

Yes.....
No.....

→ If yes, please describe how this training was conducted:

13. Does your mine have directional lifelines installed for emergency evacuation?

Yes.....
No.....

→ If yes, are the directional lifelines fire resistant?

Yes.....
No.....

↙ If no, please explain why directional lifelines have not been installed:

14. Some mines have conducted drills in environments that simulate actual emergency situations. In calendar year 2006, have you conducted any emergency drills in simulated environments?

Yes.....

No *If no, please skip to question 16*

15. If you have you conducted emergency drills in simulated environments, please provide examples of the types of activities included in these exercises for the following scenarios: *(Attach additional pages if necessary)*

Fire

Explosion

Gas inundation

Water inundation

Other, please describe:

16. During calendar year 2006, did your mine conduct the following activities to assess mine workers knowledge or skills after they participated in mine worker emergency training?

Please answer "yes" or "no" to each item

	Yes ▼	No ▼
a. Mine worker completes evaluation form eliciting feedback about instructor/instruction	<input type="checkbox"/>	<input type="checkbox"/>
b. Mine worker completes written test.....	<input type="checkbox"/>	<input type="checkbox"/>
c. Mine worker completes oral test.....	<input type="checkbox"/>	<input type="checkbox"/>
d. Mine worker demonstrates ability to instructor	<input type="checkbox"/>	<input type="checkbox"/>
e. Obtain feedback from mine worker's supervisor on knowledge or skills gained.....	<input type="checkbox"/>	<input type="checkbox"/>
f. Other, please describe:.....	<input type="checkbox"/>	<input type="checkbox"/>

Appendix II: Survey of Underground Coal Mines

17. To what extent do the following areas related to mine workers currently pose a challenge to your mine in preparing for and responding to mine emergencies, if at all?

	Not a challenge ▼	A minor challenge ▼	A moderate challenge ▼	A major challenge ▼	Not applicable ▼
a. Preparing mine workers to use SCSRs for escape	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Familiarizing mine workers with escape routes.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Training mine workers in first responder-type activities, such as fire fighting techniques.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. The loss of experienced mine workers due to retirements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. The amount of time needed to train new mine workers.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. The availability of training centers that can simulate an emergency situation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. The availability of training in a simulated mine emergency situation ..	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. The availability of certified instructors who can conduct simulated mine emergency training.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. The cost associated with simulated mine emergency training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. Other, please describe:.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Mine Rescue Teams

18. How many mine rescue teams do you currently have available to you?

_____ Teams

19. What are the names of your current mine rescue teams? Please refer to the two primary teams that you use (i.e. the two that you report to MSHA).

a) Team #1 _____

b) Team #2 _____

Note: For the remainder of the survey, you will be asked to answer questions about these two teams (e.g. "Team 1", "Team 2"). Please refer to the teams as you have identified them in Question 19 when answering these questions.

20. A. Which of the following best describes the composition of your *current* mine rescue Team #1?

Please check one

- a. Comprised of mine workers from your mine whose primary responsibilities are to serve only your mine
- b. Comprised of state employees.....
- c. Comprised of mine workers from multiple mines owned by *different* operators (may or may not be state-sponsored/designated)
- d. Comprised of mine workers from multiple mines owned by the *same* operator (may or may not be state-sponsored/designated).....
- e. Comprised of members with underground coal mine experience and organized through a third-party vendor.....
- f. Other, please describe:

B. For question 20A above, if you selected “c” or “d,” is Team #1 state-sponsored/designated or not?

- Yes, it is state-sponsored or designated.....
- No, it is not state-sponsored or designated.....
- Do not know
- Not applicable

21. A. Which of the following best describes the composition of your *current* mine rescue Team #2?

Please check one

- a. Comprised of mine workers from your mine whose primary responsibilities are to serve only your mine
- b. Comprised of state employees
- c. Comprised of mine workers from multiple mines owned by *different* operators (may or may not be state-sponsored/designated).....
- d. Comprised of mine workers from multiple mines owned by the *same* operator (may or may not be state-sponsored/designated)
- e. Comprised of members with underground coal mine experience and organized through a third-party vendor
- f. Other, please describe:

B. For question 21A above, if you selected “c” or “d,” is Team #2 state-sponsored/designated or not?

- Yes, it is state-sponsored or designated.....
- No, it is not state-sponsored or designated.....
- Do not know
- Not applicable

22. During calendar year 2006, on average, how many hours will each mine rescue team member have participated in training (include any training planned for the remainder of the year)? Please make an estimate if you do not have an exact number, and include classroom and participation in training exercises in your estimate.

Please check one

- a) Team #1? 12 to 23 hours
- 24 to 47 hours
- 48 to 63 hours
- Over 64 hours
- Do not know

Please check one

- b) Team #2? 12 to 23 hours
- 24 to 47 hours
- 48 to 63 hours
- Over 64 hours
- Do not know

23. In calendar year 2006, has the amount of training your mine rescue teams participated in or planned increased, decreased, or stayed the same in comparison to calendar year 2005?

- a) Team #1? Stayed the same
- Increased
- Decreased

Please explain why any changes occurred:

- b) Team #2? Stayed the same
- Increased
- Decreased

Please explain why any changes occurred:

24.

A. In calendar year 2006, did either of your mine rescue teams participate in mine rescue competitions?

B. How much time, on average, did the team spend preparing for these competitions?

C. Is preparation for mine rescue competitions part of fulfilling the annual training requirements for your teams or is it additional training?

a) Team #1

Please check one

- | | | | | |
|-----------------|--------------------------|---|-----------------------------|--------------------------|
| Yes | <input type="checkbox"/> | → | 8 hours or less | <input type="checkbox"/> |
| No..... | <input type="checkbox"/> | → | Between 9 to 16 hours..... | <input type="checkbox"/> |
| Do not know.... | <input type="checkbox"/> | → | Between 17 and 24 hours ... | <input type="checkbox"/> |
| | | → | Between 25 and 40 hours ... | <input type="checkbox"/> |
| | | → | Between 41 and 80 hours ... | <input type="checkbox"/> |
| | | → | More than 80 hours | <input type="checkbox"/> |
| | | → | Do not know..... | <input type="checkbox"/> |

Please check one

- Part of fulfilling annual training
- In addition to annual training
- Do not know.....

b) Team #2

Please check one

- | | | | | |
|-----------------|--------------------------|---|-----------------------------|--------------------------|
| Yes | <input type="checkbox"/> | → | 8 hours or less | <input type="checkbox"/> |
| No..... | <input type="checkbox"/> | | Between 9 to 16 hours..... | <input type="checkbox"/> |
| Do not know.... | <input type="checkbox"/> | | Between 17 and 24 hours ... | <input type="checkbox"/> |
| | | | Between 25 and 40 hours ... | <input type="checkbox"/> |
| | | | Between 41 and 80 hours ... | <input type="checkbox"/> |
| | | | More than 80 hours | <input type="checkbox"/> |
| | | | Do not know..... | <input type="checkbox"/> |

Please check one

- Part of fulfilling annual training
- In addition to annual training
- Do not know.....

Appendix II: Survey of Underground Coal Mines

25. To what extent is each of the following factors a challenge, if at all, in your rescue teams' ability to prepare for and respond to mine emergencies?

	Not a challenge ▼	A minor challenge ▼	A moderate challenge ▼	A major challenge ▼	Not applicable ▼
a. The number of mine rescue teams available to assist in the event of a mine emergency..	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. The number of mine workers available to participate on mine rescue teams	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Loss of experienced team members due to retirements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Amount of time needed to train and prepare new team members.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Access to practice facilities.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. The opportunity to participate in mine rescue competitions that simulate a real emergency situation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. The opportunity to participate in training exercises that simulate a real emergency situation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. The opportunity to conduct simulated activities that include all stakeholders that would be involved in an emergency (MSHA, state, union, and mine officials; rescue team; miners)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. The legal liability associated with assisting mines other than your own during emergencies.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. The funding required to train mine rescue teams	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k. The funding required to equip mine rescue teams	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l. The availability of up-to-date mine rescue technology and equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m. Other, please describe:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

MSHA Assistance

26. Has your mine received any assistance from the Mine Safety and Health Administration (MSHA) on preparing for a mine emergency?

Yes

No..... *If no, please skip to question 28*

27. If yes, please provide examples of the type of assistance you have received from MSHA on preparing for a mine emergency.

28. What do you think of the amount of assistance that MSHA provided your mine in preparing for a mine emergency?

They provided too much

The amount they provided is just right.....

They do not provided enough

28 A. What additional assistance would you like to receive from MSHA to help your mine prepare for a mine emergency?

Appendix II: Survey of Underground Coal Mines

MINER Act Provisions					
<p>The following questions ask about anticipated changes resulting from the MINER Act. Recognizing that guidance about specific provisions from the Act may not be available yet, please answer these questions to the best of your ability based on your current thinking. In addition, please answer only for anticipated changes resulting from the MINER Act as opposed to anticipated changes for other reasons.</p>					
29. Which of the following provisions of the MINER Act will require changes, if any, to current practices at your mine?					
	No change ▼	A minor change ▼	A moderate change ▼	A major change ▼	Not applicable ▼
a. That mine rescue teams be available at the mine within one hour ground travel time from the mine rescue station	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. That mine rescue teams participate at least annually in two local mine rescue contests	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. That mine rescue teams train on a regular basis in the mines they are responsible for covering.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. That the mine rescue team is knowledgeable about the operations and ventilation of the covered mines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. That certain mine rescue teams are comprised of individuals with a minimum of 3 years underground coal mine experience that occurred within the 10 years preceding their employment on the mine rescue team	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Other, please describe:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17					

30. A. Do you anticipate making changes to the composition of your mine rescue Team #1 as a result of provisions in the MINER Act? Please select the option that best describes your new team.

Please check one

- a. New team will be comprised of mine workers from your mine whose primary responsibilities are to serve only your mine
- b. New team will be comprised of state employees
- c. New team will be comprised of mine workers from multiple mines owned by different operators (may or may not be state-sponsored/designated)
- d. New team will be comprised of mine workers from multiple mines owned by the same operator (may or may not be state-sponsored/designated)
- e. New team will be comprised of members with underground coal mine experience and organized through a third-party vendor
- f. No change
- g. Other, please describe:

B. For question 30A above, if you selected “c” or “d,” do you anticipate Team #1 being state-sponsored/ designated or not?

- Yes, it will be state-sponsored or designated
- No, it will not be state-sponsored or designated
- Not applicable

31. A. Do you anticipate making changes to the composition of your mine rescue Team #2 as a result of provisions in the MINER Act? Please select the option that best describes your new team.

Please check one

- a. New team will be comprised of mine workers from your mine whose primary responsibilities are to serve only your mine
- b. New team will be comprised of state employees
- c. New team will be comprised of mine workers from multiple mines owned by *different* operators (may or may not be state-sponsored/designated).....
- d. New team will be comprised of mine workers from multiple mines owned by the *same* operator (may or may not be state-sponsored/designated).....
- e. New team will be comprised of members with underground coal mine experience and organized through a third-party vendor.....
- f. No change.....
- g. Other, please describe:

B. For question 31A above, if you selected “c” or “d,” do you anticipate Team #2 being state-sponsored/ designated or not?

- Yes, it will be state-sponsored or designated
- No, it will not be state-sponsored or designated
- Not applicable.....

32. In your opinion, in the event of an emergency, what should the requirement be for ground travel time between the mine rescue station and the mine?

_____Hours

32a. Please explain the factors you considered in selecting this amount of time:

Additional Comments

33. Do you have any other comments that you would like to share?

Appendix III: Comments from the Department of Labor

U.S. Department of Labor

Mine Safety and Health Administration
1100 Wilson Boulevard
Arlington, Virginia 22209-3939



MAY 01 2007

Mr. Daniel Bertoni
Director
Education, Workforce, and
Income Security Issues
General Accounting Office
441 G. Street, NW
Washington, DC 20548

Dear Mr. Bertoni:

Thank you for the opportunity to comment on your draft report titled "Better Oversight and Coordination by MSHA and Other Federal Agencies Could Improve Safety for Underground Coal Miners" (GAO-07-622). We concur with the intent of your recommendations and our response is enclosed. Also included is an additional commentary which highlights sections of your report we believe require correction or clarification.

We look forward to continued dialogue with your staff regarding any additional corrective actions which may be required to resolve your recommendations. If you have any questions, please contact Brent Carpenter (MSHA) at (202) 693-9782 or Heidi Strassler (SOL) at (202) 693-9366.

Sincerely,


Richard E. Stickler
Assistant Secretary of Labor for
Mine Safety and Health


Jonathan L. Snare
Acting Solicitor of Labor

Enclosure

GAO Recommendation

To help [mine operators] train their workers under simulated emergency conditions, the Secretary of Labor should direct MSHA to publicize information and available tools for training mine workers under such conditions. In addition, MSHA should periodically review and update this information, as appropriate.

MSHA Response

Through our website, MSHA will establish a “single-source” page identifying where operators may be able to obtain training facilities for simulated training (e. g. fire houses, simulated mines, military resources). This page will consolidate various information currently available on the MSHA web site, as well as incorporate subsequently released information. We will also issue a Program Information Bulletin (PIB) for mine operators to make them aware of the web site and the information available.

One example of MSHA publicizing useful information regarding emergency training involved the availability of self-contained, self-rescuer (SCSR) “expectation training models”. By way of background, MSHA’s Emergency Mine Evacuations Final Rule of December 8, 2006, included language requiring the donning of an SCSR in a simulated smoke filled environment. The Rule also provided for “expectations training” which requires breathing through a device that replicates the actual breathing experience of an SCSR. Likewise, in developing the Emergency Mine Evacuations Rule, MSHA asked the SCSR manufacturers to develop training models that would replicate the actual breathing experience of their live SCSR. The manufacturers complied with MSHA’s request and on March 30, 2007, MSHA published in the *Federal Register* a notice alerting mine operators to the availability of realistic SCSR training units.

In an effort to provide mine operators additional training resources and options, MSHA’s Office of Educational Policy and Development (EPD) recently requested that NIOSH conduct research to examine various methods of providing simulated mine emergency training. In particular, EPD asked NIOSH to identify practical approaches to this issue, recognizing that some simulated training may be somewhat cost prohibitive.

GAO Recommendation

To help ensure that mine workers are adequately prepared for emergencies, MSHA should strengthen its monitoring of training. This monitoring should include:

- **Reviewing and standardizing districts' procedures for certifying new instructors**

For clarification, MSHA *approves* instructors to conduct Part 48 training. Generally, MSHA reviews an instructor applicant's qualifications for "an ability to teach" and "subject knowledge." MSHA's Educational Policy and Development and Coal Mine Safety & Health will coordinate the development and implementation of standardized procedures to ensure consistency of this approval process.

- **Establishing continuing education requirements for instructors to help instructors maintain or improve their knowledge and skills;**

Through a variety of conferences and educational forums, MSHA approved instructors can enhance their health and safety knowledge and instructional skills. For example, the annual EPD-sponsored *Training Resources Applied to Mining Conference* is specifically designed for mine safety instructors and is attended by approximately 600 instructors from throughout the mining industry. In addition, MSHA partners with industry representatives in offering regional health and safety conferences. EPD sponsors an organization dedicated to the health and safety of our nation's miners and encourages participation by industry and labor in local and regional Association meetings. MSHA partners with this organization to provide materials/publications, such as Professional Miner newsletters and the Holmes Safety Association Bulletins.

Implementing a continuing education program for MSHA approved instructors may require a change in the existing regulatory standards. EPD has recently requested NIOSH to analyze the effectiveness of requiring a continuing education requirement for our approved instructors. MSHA will review options, including a potential regulatory revision, as we more fully consider this recommendation.

▪ **Improving the data in its records on certified instructors; and**

MSHA recognizes that the existing database of approved instructors needs to be updated. As a result, we have developed an initiative that involves MSHA's Educational Field Services Training Specialists and Small Mine Office Safety Specialists who have previous coal experience. The initiative includes a visit to each underground coal mine to determine that the mine safety and training staff (including contract and state grant trainers) are aware of mine specific training requirements. The visit will also include a review of the Part 48 and 75 training plans. This will help to determine that appropriate information and objectives are met and a sample survey of miners will be done to determine that the training is adequate and beneficial. The specialists have also been asked to inquire about the future training schedule so that follow up visits can be planned to further evaluate the training.

Additionally, we recognize the need for improvement in data collection. In the short-term, MSHA is developing a plan to create new electronic reports for tracking people who have been approved as instructors. MSHA is also working to improve instructor monitoring and tracking of instructor monitoring. The long-term process for creating the capability to update, maintain, and disseminate current instructor data includes the following sub-processes: development of business rules, completion of a cost-benefit analysis, creation of a funding request, identification of system requirements, identifying specifications, and developing code.

▪ **Developing a process for monitoring miner training that includes regularly evaluating training sessions, assessing how well learning objectives are being met, and providing feedback to certified instructors.**

MSHA intends to develop an instructor evaluation and feedback plan to determine the effectiveness of instruction. Through monitoring instructors, MSHA will assess the instructors' learning objectives and evaluation strategy to ensure that the training needs of the miners are met. As applicable, recommendations will be provided to the instructor after completion of the instructor monitoring. Finally, MSHA intends to explore the option of using individuals with requisite mine experience for the purpose of monitoring instructors.

GAO Recommendation

To improve the effectiveness of information sharing between MSHA and NIOSH, we recommend that the Secretaries of Labor and Health and Human Services direct their respective agencies to work together to establish a formal memorandum of understanding to guide their coordination. In addition, the agencies should periodically review and update the memorandum, as appropriate.

MSHA Response

We agree that a formal “memorandum of understanding” (MOU) between MSHA and NIOSH would serve to better guide coordination efforts and formalize working relationships. An effective MOU would set forth an understanding between MSHA and NIOSH on issues of coordination, communication, and cooperation, and would be periodically updated by the agencies when appropriate to revise procedures or update sections as needed. Starting in 2002, MSHA and NIOSH worked together to develop a draft MOU concerning the issues mentioned above, however, the document was never finalized and signed. MSHA plans to revitalize the MOU effort with NIOSH and bring it to closure.

GAO Recommendation

In order to ensure that there is transparency in penalty determinations, we recommend that the Department of Labor’s Office of the Solicitor, MSHA, and the Commission take steps to ensure that the specific rationale for all final penalty amounts, including reductions from MSHA’s proposed penalties, are adequately documented.

MSHA and Solicitor’s Office (SOL) Response

MSHA proposes penalty assessments in conformance with the procedures and tables listed in 30 C.F.R. part 100. That regulation sets out the factors to be considered and provides for notice of the proposed penalty assessment, which may be contested before the Federal Mine Safety and Health Review Commission (Commission) After the penalty is proposed, of course, MSHA and SOL sometimes decide to settle an alleged violation and its proposed penalty, based on several factors. Often, new factual information is found during the post-assessment discovery process, and the evidence necessary to support the violation is re-evaluated. Professional judgments are made regarding the strength of the evidence as applied to the cited standard and the likelihood of success at trial, including the likely amount of any final penalty which may be

imposed by the administrative law judge. MSHA and SOL agree that transparency in any resulting civil penalty settlement agreement is essential to ensure public confidence that the purposes of the Mine Act are fulfilled and that administration of the Mine Act is fair. Under the Mine Act, every time the parties reach a settlement agreement, it must be submitted to the Commission, which is independent, for approval. Because the Mine Act requires Commission approval of settlement agreements, and because the Commission will only approve a settlement agreement if it determines that it is in the best interest of the public, settlement agreements always contain supporting reasons for the positions adopted by the parties involved. Moreover, internal audits of the CLR program emphasize the need for adequate documentation to support settlement agreements. In addition, MSHA and SOL will formally remind CLR and attorneys to ensure that the rationale for all civil penalty agreements is adequately documented in settlement agreements and case file notes.

Appendix IV: Comments from the Department of Health & Human Services



DEPARTMENT OF HEALTH & HUMAN SERVICES

Office of the Assistant Secretary
for Legislation

Washington, D.C. 20201

APR 26 2007

Daniel Bertoni, Director
Education, Workforce, and
Income Security Issues
U.S. Government Accountability Office
Washington, DC 20548

Dear Mr. Bertoni:

The Department of Health and Human Services has reviewed the U.S. Government Accountability Office's (GAO) draft report entitled: Mine Safety: Better Oversight and Coordination by MSHA and Other Federal Agencies Could Improve Safety for Underground Coal Miners " (GAO 07-622).

The department concurs with the recommendation to establish an MOU between NIOSH and MSHA. We agree that this will help strengthen current coordination activities.

The department appreciates the opportunity to comment on this draft report before its publication.

Sincerely,
Rebecca Hemard
for Vincent J. Ventimiglia
Assistant Secretary for Legislation

Appendix V: Comments from the Federal Mine Safety and Health Review Commission



FEDERAL MINE SAFETY AND HEALTH REVIEW COMMISSION

OFFICE OF THE CHAIRMAN

April 19, 2007

Mr. Daniel Bertoni, Director
Education, Workforce, and Income Security Issues
U.S. Government Accountability Office
441 G Street, NW
Washington, D.C. 20548

Dear Mr. Bertoni:

Re: Draft Report: Better Oversight and Coordination by MSHA and Other Federal Agencies Could Improve Safety for Underground Coal Miners

The Federal Mine Safety and Health Review Commission (the Commission) is pleased to comment on the above Draft Report. We commend the GAO on its thorough research and thoughtful recommendations regarding the current federal program governing the safety and health of our Nation's underground coal miners. Our comments are limited to those sections specifically addressing the Commission's role in the resolution of disputes arising from the enforcement of the Federal Mine Safety and Health Act of 1977, as amended (the Mine Act), but we find the report's research, conclusions, and recommendations regarding other aspects of the federal program enlightening and beneficial.

At the outset, the Commission agrees with the GAO that there needs to be transparency in penalty determinations and that specific rationales need to be provided when penalties are reduced from those levels originally proposed by MSHA. As the Draft Report indicates at page 38, it has long been the policy of the Commission that such reductions must be supported on the record:

When . . . it is determined that penalties are appropriate which substantially diverge from those originally proposed, it behooves the Commission and its judges to provide a sufficient explanation of the bases underlying the penalties assessed by the Commission. If a sufficient explanation for the divergence is not provided, the credibility of the administrative scheme providing for the increase or lowering of penalties after contest may be jeopardized by an appearance of arbitrariness.¹

¹ *Jim Walter Resources, Inc.*, 28 FMSHRC 579, 606-07 (August 2006) (citing *Sellersburg Stone Co.*, 5 FMSHRC 287, 293 (March 1983)).

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At the same time, it must be remembered that Congress adopted the split enforcement model, whereby MSHA enforces the Mine Act and the Commission adjudicates disputes arising under the Act, so as to provide for independent, *de novo* review of the circumstances surrounding an alleged violation of the Act and MSHA's rationale for seeking a civil sanction. Thus, it should be expected that among the 6 percent of penalties proposed to be assessed by MSHA that are appealed (Draft Report at 5), a significant share would end up being reduced once all issues are fully joined before a Commission judge. At that point and in a neutral forum, the operator is allowed to present evidence of mitigating circumstances or evidence that the MSHA inspector misinterpreted or misapplied the safety or health standard in question. Once that countervailing evidence has been presented to the judge, MSHA's preliminary characterizations as to the relative seriousness or operator culpability surrounding the citation might not prevail. Conversely, it can also be the case that the evidence adduced at a full hearing might demonstrate higher levels of seriousness or negligence than originally alleged by MSHA, thus warranting the assessment of a penalty by the judge that exceeds MSHA's proposed penalty. In either case, the Commission's guidance to its judges has been explicit:

While Commission judges are accorded broad discretion in assessing civil penalties under the Mine Act, such discretion is not unbounded and must reflect proper consideration of the penalty criteria set forth in section 110(i) and the deterrent purpose of the Act. *Westmoreland Coal Co.*, 8 FMSHRC 491, 492 (April 1986) (citing *Sellersburg Stone Co.*, 5 FMSHRC 287, 290-94 (Mar. 1983), *aff'd*, 736 F.2d 1147 (7th Cir. 1984)). In reviewing a judge's penalty assessment, the Commission determines whether the penalty is supported by substantial evidence and is consistent with the statutory penalty criteria. *Hubb Corp.*, 22 FMSHRC 606, 609 (May 2000). While "a judge's assessment of a penalty is an exercise of discretion, assessments lacking record support, infected by plain error, or otherwise constituting an abuse of discretion are not immune from reversal . . ." *U.S. Steel Corp.*, 6 FMSHRC 1423, 1432 (June 1984).²

In that connection, the Commission submits that the reduction in the civil penalty in *Wabash Mine Holding Co.*, 27 FMSHRC 672 (October 2005) (Draft Report at 39), comports with the Commission's policy set forth above and with the GAO's persuasive exhortation that final assessments of penalties be transparently determined and adequately documented. Accordingly, we respectfully but firmly disagree with the GAO's conclusion that the judge's rationale for reducing the penalty amount in that case was not well documented.

In *Wabash*, the judge reduced a \$50,000 proposed penalty to \$10,000 after explicitly finding, contrary to MSHA's arguments, that the subject violation did *not* contribute to the fatal accident at issue in the case. *Id.* at 684-85. The violation thus went from one alleged by MSHA to have contributed to a fatality to one found by the judge to have had nothing to do with the fatality, thereby greatly reducing its level of seriousness. Nevertheless, the resulting penalty of \$10,000, based largely upon the judge's agreement with MSHA that the violation resulted from the

² *Jim Walter Resources*, 28 FMSHRC at 606.

**Appendix V: Comments from the Federal Mine
Safety and Health Review Commission**

operator's high degree of negligence, is more than five times larger than the average penalty MSHA normally proposes for violations attributed to high negligence. (Draft Report at 33, Table 4). In short, we believe the judge in *Wabash* sufficiently articulated his reasons for reducing the penalty initially proposed by MSHA.

Other than our substantive comments set forth above, we have only two stylistic matters to bring to your attention. First, the citation to the *Jim Walters* decision in footnote 40 on page 39 of the Draft Report should read: *Jim Walter Resources, Inc.*, 28 FMSHRC 579, 606-07 (August 2006). Second, Figure 1 on page 10 does not provide for the circumstance where no civil penalty is ultimately assessed because the citation or order upon which it is based has been vacated by the Commission judge, the Commission, or the Circuit Court of Appeals.

The Commission once again commends the GAO on its informative and thoughtful Draft Report, and we thank you for the opportunity to provide comments on the report before it is released in final form. If you have any questions or require additional information from the Commission, please do not hesitate to contact us.

Sincerely,



Michael F. Duffy
Chairman

Appendix VI: GAO Contact and Acknowledgments

GAO Contact

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Staff Acknowledgments

Reva E. Moran, Assistant Director, and Sara L. Schibanoff, Analyst-in-Charge, managed this assignment. Other staff who made key contributions throughout the assignment are Joel A. Green, Jeremie C. Greer, Gillian M. Martin, Mary Roy, and Rachael C. Valliere. Sheila R. McCoy provided legal assistance. Cindy K. Gilbert, Nancy A. Hess, Catherine M. Hurley, and Shana B. Wallace assisted with the methodology and statistical analysis.

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