



JUL 24 2008

MEMORANDUM FOR HOWARD RADZELY
Deputy Secretary of Labor

FROM: RICHARD E. STICKLER *Richard E. Stickler*
Acting Assistant Secretary for
Mine Safety and Health

SUBJECT: Response to the Independent Review of
MSHA's Actions at Crandall Canyon Mine

Thank you for the opportunity to review and comment on the report, "*Independent Review of MSHA's Actions at Crandall Canyon Mine Genwal Resources, Incorporated Huntington, Emery County, Utah*," dated July 21, 2008. The Mine Safety and Health Administration (MSHA) remains committed to making improvements that will benefit our nation's miners and values the Independent Review Team's (IRT) work in writing its report and developing recommendations.

Over the last two years, MSHA has implemented numerous policy changes and new regulations. Some of these changes are derived from the Mine Improvement and New Emergency Response Act of 2006 (MINER Act), while some are the agency's own initiative. MSHA will continue to make changes that will improve mine safety and health.

It is important to note that the report confirms the dedication of MSHA employees, as reflected in the IRT's determination that there was "no lack of hard work and perseverance put forth by personnel involved in the rescue operation." The report further recognizes that MSHA field personnel "worked diligently, most often under stressful and dangerous conditions" and that MSHA managers "put forth a tremendous effort" and "assumed immense responsibility under intense pressure."

Additional findings of the IRT include:

- MSHA District 9 personnel properly conducted and completed mandated inspections;
- MSHA District 9 was properly enforcing the MINER Act and MSHA's Mine Emergency Evacuation regulations, including -
 - Prompt incident notification,

- Emergency response plan (ERP) compliance,
- ERPs that addressed post-accident communications,
- ERPs that addressed post-accident tracking systems,
- ERPs that addressed post-accident breathable air,
- Purchase of Self-Contained Self-Rescuers,
- Installation of lifelines along escapeways;
- MSHA's family liaisons provided timely and useful information to the families throughout the rescue and recovery efforts; and
- There was no evidence that MSHA was improperly influenced by Robert Murray or anyone in his company.

We should always look for additional – and better – ways to protect miners. The purpose of the Independent Review Team's report is to help MSHA learn from the Crandall Canyon tragedy and identify areas for improvement. While we disagree with some of the report's findings, many of the recommendations are helpful, and MSHA intends to adopt changes that will be effective in moving forward toward that goal.

With regard to the majority of deficiencies identified by the IRT, additional improvements can, and should, be made. In fact, before issuance of the final report, MSHA fully implemented changes that address 13 IRT recommendations. MSHA has also initiated actions that will address another 28 recommendations and has specific milestones for completing each action. These actions include improvements in the following areas:

- Utilizing more rigorous screening of mining plans for mines under deep cover;
- More closely examining retreat mining operations;
- Providing additional training for MSHA personnel;
- Increasing the number of enforcement and technical assistance personnel;
- Issuing more detailed guidance for mine operators and MSHA personnel on roof control approvals, retreat mining and other areas;
- Expanding technical support capabilities;
- Securing more advanced equipment for mine rescue activities; and
- Enhancing oversight by MSHA management of inspections and mining approvals so that mine safety requirements are consistently applied nationally.

Also, MSHA plans to implement additional changes with specific completion milestones with regard to another 35 IRT recommendations. In cases where MSHA did not agree with a finding or recommendation, MSHA explained its disagreement and provided an alternative means of addressing it. In the areas in which MSHA did not believe the recommendation was supported, we declined

to implement the recommendation and explained our concerns. We do take issue with a few of the IRT's findings:

- Perhaps because they were not present at the site during the rescue effort, the IRT also suggested MSHA could have made additional exploratory excursions over the top of the rubble in the collapsed tunnels. Rescue operations in an underground coal mine are inherently dangerous, particularly where there has been a massive bounce and seismic activity continues. Mine rescue protocols, in fact, dictate that the safety of rescuers is a primary priority. As more fully explained in MSHA's response, the conditions, as analyzed by those on site, precluded this option.
- The IRT suggested that certain MSHA personnel may have felt their input was not welcome during the rescue operations. MSHA is not aware of any personnel who were denied the opportunity to provide input and believes the IRT's determination may result from a misunderstanding arising from the Assistant Secretary's insistence during an innately stressful situation that personnel provide fully accurate and timely information. The MSHA District Manager contemporaneously reassigned several employees to better utilize their individual skills during the rescue, which some employees may have misconstrued. There was, however, no disciplinary action threatened or taken by MSHA management, including the Acting Assistant Secretary, the Administrator for Coal Mine Safety and Health or the District Manager during rescue operations.
- Also, there was certainly tension between the mine operator and MSHA, and MSHA certainly agrees with concerns that the operator's public statements may have created confusion with the public and the families of the miners his company employed. Indeed, MSHA attempted to correct inaccurate information provided by the operator and limit his involvement with the families and media. The IRT mistakenly believed that the MINER Act provision designating MSHA as the primary communicator to the families and the media prohibits others (including the mine operator, media, prospective attorneys, or elected officials) from communications with them as well.

In closing, I appreciate the opportunity to express MSHA's views on the IRT's conclusions and thank the IRT for their contributions to improving mine safety and health.

Please find attached a more detailed response to each of the report's recommendations, including MSHA's proposed and completed corrective actions, and respective milestones.

If you have any questions, please feel free to contact me directly or Kevin Stricklin at 202-693-9500.

Attachment

MSHA Response to the Recommendations from the Independent Review of MSHA's Actions at Crandall Canyon Mine

Topic: Roof Control Plan Approval

Recommendation No. 1 (IR page 20): Data that is submitted by a mine operator to justify mining and plan approval should be thoroughly evaluated by the Mine Safety and Health Administration (MSHA).

Recommendation No. 2 (IR page 20): District management should provide adequate oversight for the plan approval process.

Recommendation No. 5 (IR page 22): Issues identified with supporting data should be adequately resolved, with any follow-up information verified by MSHA.

Recommendation No. 6 (IR page 24): When plans are to be approved based on the success of a previous plan, any pertinent information, including failures, should be investigated and considered in the plan approval process.

Recommendation No. 8 (IR page 27): Consultant recommendations used to support mine plan submittals should be specifically addressed in such plan approvals.

MSHA Response: MSHA has completed the following corrective actions:

1. Coal Mine Safety and Health (CMS&H) Administrator letter to mine operators issued on June 3, 2008, requesting detailed and comprehensive data and information in their submittals for approvals of complex and/or non-typical roof control plans. In addition "Where recommendations are made by consulting engineers, the operator shall provide the reports upon which the assertion of adequacy depends and direct the consultant to cooperate fully with the MSHA plan reviewers in verifying their conclusions."

Milestone: Completed 06/03/2008

2. CMS&H Administrator memo "Approval of Complex and/or Non-typical Roof Control Plans and Amendments" (CMS&H Memo HQ-08-058-A) issued on June 5, 2008, indicating that mine operators are required to submit all input data and/or information used by the mine operator or by consultants to determine the adequacy of a roof control plan submittal, and that "MSHA shall first establish that the submitted supporting information is adequate, given the complexity and severity of the mining environment, and request additional information if needed . . . MSHA shall not approve the proposed plan or amendment until the operator has provided the data and evaluation supporting the proposal and a confirming evaluation(s) has been completed."

Milestone: Completed 06/05/2008

3. Procedure Instruction Letter (PIL) No. I08-V-2 "Technical Support Assistance in Reviewing Roof Control Plans" issued on May 29, 2008, provides guidance for district personnel on when to send roof control plans and amendments to Technical Support for further review.

Milestone: Completed 05/29/2008

4. CMS&H Administrator memo "Documentation of Roof Control Plan Reviews" (CMS&H Memo HQ-08-059-A) issued on June 6, 2008, provides guidance for MSHA personnel on roof control plan approvals and reviews and to implement a standardized roof control plan approval process to ensure consistent reviews and oversight among all districts.

Milestone: Completed 06/06/2008

5. Documentation required (by CMS&H Memo HQ-08-059-A) on the rationale behind the approval of plans and includes completed checklist(s), as applicable, showing plan reviews with the name(s) of the reviewer(s), their signatures, date of review, and any comments of those individuals participating in the review process.

Milestone: Completed 06/06/2008

6. The "Roof Control Plan Approval Process" (CMS&H Memo HQ-08-059-A) establishes a system for multi-level review and oversight to identify and address deficiencies in roof control plans.

Milestone: Completed 06/06/2008

7. Instructions were provided to District Managers that plans are to be signed and approved by the District Manager, and in his/her absence, the Acting District Manager at the GS-14 level.

Milestone: Completed

8. Checklists for roof control plan revisions reviews issued on June 6, 2008: "Roof Control Plan Review Form Checklists for Plan Revisions;" and where applicable "Extended Cuts Safety Precautions Checklist," "Retreat Mining Precautions Checklist," and "Mine-Specific Mobile Roof Supports Checklist." A detailed historical record of safety conditions at the mine including accident data, roof

control citations, injuries, and roof falls shall be reviewed for plan revisions, 6-month and quarterly reviews.

Milestone: Completed 06/06/2008

The use of roof control checklists by inspectors is pending bargaining between MSHA and the National Council of Field Labor Locals (NCFLL). Until an agreement is reached with the NCFLL, the checklists will be completed by the supervisor.

Recommendation No. 3 (IR page 20): MSHA should provide training to appropriate district personnel in computer software that is commonly used to justify mining plans.

MSHA Response: MSHA has completed the following corrective actions (or will complete by the projected milestone date):

1. Trained 60 MSHA employees on National Institute for Occupational Safety and Health (NIOSH) and RocScience computer modeling software for roof/pillar stability in Denver and Beckley on November 26-30, 2007 and Triadelphia on December 3-7, 2007.

Milestone: Completed 12/07/2007

2. Refresher training will be provided on Analysis of Longwall Pillar Stability (ALPS) and Analysis of Retreat Mining Pillar Stability (ARMPS) at the Academy on August 28, 2008.

Milestone: 08/28/2008

3. Additional guidance provided in MSHA Program Information Bulletin P08-08 "Precautions for the Use of the Analysis of Retreat Mining Pillar Stability (ARMPS) Computer Program" (PIB P08-08), issued on 04/07/2008.

Milestone: Completed 04/07/2008

4. Future MSHA PIB, addressing general guidelines for the use of numerical modeling, will be developed to provide guidance on the type of information that should be provided in any submittal to MSHA that is used in support of a roof control plan approval.

Milestone: 08/01/2008

5. Future MSHA PIB will be issued after West Virginia University develops and issues guidelines for the use of LAMODEL.

Milestone: To Be Determined

Recommendation No. 4 (IR page 22): The District Standard Operating Procedure (SOP) should be modified to require a written response from the mine operator when plan deficiencies have been identified in writing.

Recommendation No. 10 (IR page 29): The District 9 plan approval SOP should be modified to clearly state that a written response is required when a plan has been identified as inadequate via the 2000-204 form. The response should be directed to the appropriate field office supervisor as well as to the inspector who cited the deficiency.

Recommendation No. 12 (IR page 30): The District Manager should implement a system to assure that, when appropriate, input from field office personnel is obtained prior to recommending approval or disapproval of a plan or plan revision.

Recommendation No. 14 (IR page 32): The District 9 Manager should ensure that roof control and ventilation plans are compatible as per MSHA policy.

MSHA Response: MSHA has completed the following corrective actions (or will complete by the projected milestone date):

1. District 9 SOPs in the Ventilation and Roof Control Groups have been revised to clarify when a written response is needed in regard to a plan disapproval or response from the operator and the need to obtain feedback from field office personnel concerning mine conditions as an integral part of the plan review process. As part of the District SOPs, all specialty work groups will include joint review requirements when overlapping plans are submitted to ensure no conflicts or inconsistencies exist and the plans are compatible as per MSHA policy.

Milestone: Completed 06/03/2008 (Ventilation SOP) and 07/08/2008 (Roof Control SOP)

2. The Roof Control Group has set up a tracking sheet for quarterly 2000-204 forms to ensure that quarterly 2000-204 forms are tracked. Any plan deficiencies identified on the form are addressed as soon as possible in writing (memo) to the originating inspector. When appropriate, the Field Office Supervisor is contacted to determine the adequacy of the roof control plans. The mine operator is then informed in writing of the plan deficiencies in letter format.

Milestone: Completed 07/08/2008 (Roof Control SOP and 2000-204 tracking sheet)

3. CMS&H Headquarters will issue guidance requiring that all districts obtain feedback from field office personnel and respond in writing (memo) to the originating inspector and the appropriate Field Office Supervisor who cited the deficiency and inform them of their agreement or disagreement with the deficiency cited as part of the plan review process. The 2000-204 form will be attached to the memo to the inspector and Field Office Supervisor.

Milestones: 11/01/2008

4. All CMS&H districts will implement a system, if there is not an existing one in place, to allow field office personnel the opportunity to comment on roof control submittals, when appropriate, before approval or denial by the District Manager.

Milestone: 11/01/2008

Recommendation No. 7 (IR page 25): An on-site investigation should be conducted of each phase of all unique or non-typical mining plans.

Recommendation No. 13 (IR page 31): All MSHA districts should use Technical Support whenever plan submittals exceed their ability to fully evaluate the supporting technical data. Districts should also consult Technical Support on retreat mining submittals in instances of overburden greater than 1000 feet that do not meet the NIOSH recommended ARMPS pillar stability factors.

MSHA Response: MSHA has completed the following corrective actions:

1. CMS&H Administrator memo on "Corrective Measures for Inspection and Investigation Activities Related to Roof Control Plans and Related Miner Training" (CMS&H Memo HQ-08-055-A) issued on 06/03/2008 requires that all sections where retreat mining is occurring must be inspected at least monthly. The inspection will be conducted by a roof control specialist, as resources permit, or by a regular inspector at a minimum.

Milestone: Completed 06/03/2008

2. CMS&H Administrator memo "Approval of Complex and/or Non-typical Roof Control Plans and Amendments" (CMS&H Memo HQ-08-058-A) issued on June 5, 2008, instructs the districts to seek the assistance of MSHA's Technical Support Roof Control Division and that a site visit shall be made by District personnel where applicable.

Milestone: Completed 06/05/2008

3. Procedure Instruction Letter (PIL) No. I08-V-2 "Technical Support Assistance in Reviewing Roof Control Plans" issued on May 29, 2008, provides guidance for district personnel on when to send roof control plans and amendments to Technical Support for further review: bounce- and bump-prone mines; utilize room and pillar retreat mining at overburden depths of 1000 feet and greater; do not meet or exceed the ARMPS design criteria listed in PIB P-08-08, or that do not meet or exceed minimum safety criteria for other computer models used; and any other criteria at the discretion of the district manager, including plans that are complex, non-typical, or present unique or novel situations.

Milestone: Completed 05/29/2008

Recommendation No. 9 (IR page 27): When plan approval is based on computer modeling, model input parameters should be specifically reflected in the plan.

MSHA Response: We disagree, in part, with this recommendation that model input parameters should be reflected in the roof control plan. Supporting discussion for the recommendation mentions the failure to include both "mining height used" and the provision for "slabbing or mining into, the barrier" in the roof control plan when in fact, these were plan violations.

The roof control plan in effect at the time of the accident was clearly violated. The Genwal Resources Inc (GRI) accident investigation addresses two specific roof control plan issues with regard to the recommendation stated. As a result, two separate violations contributory to the accident are being issued. The first addresses pillar recovery mining "in the Main West South Barrier. The site specific approved plan does not permit mining in any of the barrier to the south of the No. 1 entry between crosscut 142 and crosscut 139. The barrier south of the No. 1 entry was mined in this restricted mining area."

The second contributory violation addresses mining height where "the mining of bottom coal exposed persons to hazards caused by faulty pillar recovery methods. GRI mined up to five feet of additional bottom coal from the barrier and the pillars. This resulted in pillars with heights up to 13 feet, as opposed to the original 8-foot high pillars. This compromised the stability of the pillars. These pillar dimensions were not compatible with effective control of coal or rock bursts."

To prevent internal plan contradictions, CMS&H will assure that a thorough analysis be conducted of plan consultant recommendations and all model input parameters will be fully considered for plan design and resultant approvals. Further, CMS&H will maintain all supporting information and consultant materials, albeit separate from the

plan. Parameters, such as maximum pillar height, minimum pillar dimensions, and maximum cover, will be specified in the operator's roof control plan.

MSHA has completed the following corrective action:

1. The "Roof Control Plan Approval Process" (CMS&H Memo HQ-08-059-A) establishes a system for multi-level review and oversight to identify and address deficiencies in roof control plans. "The specialist reviews the plan, and if there are deficiencies, the specialist contacts the operator . . . The specialist, Field Office Supervisor, or CMI will visit the mine site if needed, and the specialist will calculate or verify the ARMPS/ ALPS stability factor if applicable."

Milestone: Completed 06/06/2008

Recommendation No. 11 (IR page 29): The MSHA 2000-204 forms should be used to provide feedback from field personnel and not as the sole means of conducting the six-month plan review. Headquarters should require that six-month reviews are conducted by specialists.

MSHA Response: We disagree with this recommendation to the extent that it provides that Headquarters should require that only specialists conduct six-month reviews. MSHA inspectors are capable of conducting, and should conduct 6-month reviews at less complex mines. This allows our specialists the opportunity to spend more time on the more complex and non-typical mines and their review and/or approval of these respective plans. In addition, the use of our valuable resources in this manner provides an opportunity for the inspectors to communicate their concerns, if any, on the relevant roof control or ventilation plans. MSHA is taking corrective action on Recommendation 12, described previously, and will implement a system to assure that, when appropriate, input from field office personnel is obtained prior to recommending approval or disapproval of a plan or plan revision. This approach is just another avenue to permit the inspectors to provide input.

MSHA has completed the following corrective actions:

1. CMS&H Administrator memo on "Documentation of Roof Control Plan Reviews" (CMS&H HQ-08-059-A) issued on June 6, 2008, requires that the Plan Review form (MSHA Form 2000-204) be completed by the inspector to document the adequacies/deficiencies in the current roof control plan. The regular inspector should conduct the six month reviews of less complex mines in the District with assistance provided by the roof control specialist as needed; roof control specialist conducts the six month reviews of more complex mines.

Milestone: Completed 06/06/2008

2. The "Six Month and Quarterly Roof Control Plan Review Form Checklist" (CMS&H HQ-08-059-A) should be used when conducting the six-month plan review.

Milestone: Completed 06/06/2008

Topic: Inspections

Recommendation No. 15 (IR page 35): District 9 managers and supervisors should use available data, including key indicators, to evaluate inspection data that is inconsistent with other inspections.

Recommendation No. 16 (IR page 35): Appropriate actions should be taken to correct any deficiencies and to prevent their recurrence.

MSHA Response: MSHA has completed the following corrective actions (or will complete by the projected milestone date):

1. MSHA Performance Standards were revised to assure that District Managers and Supervisors use MSHA key indicators to direct resources to monitor and improve enforcement performance and quality.

Milestone: Complete 10/31/2007

2. MSHA key indicator reports were developed for Managers and Supervisors to reduce fatalities and injuries in our Nation's coal mines by using the MSHA key indicators to direct resources to monitor and improve enforcement performance and quality.

Milestone: Complete 2/29/2008

3. District 9 Managers and Supervisors will use available data, including key indicators, to evaluate inspection data that is inconsistent with other inspections. The District Manager will provide the CMS&H Administrator with a quarterly memo, until further notice, that outlines the district's use of key indicators to evaluate inspection data and to report on the results and corrective actions to address deficiencies and to prevent their recurrence, if any.

Milestone: 11/01/2008

Recommendation No. 17 (IR page 37): The District 9 Manager should ensure that the Price Field Office complies with the *Hazards Complaint Procedures Handbook*.

Recommendation No. 18 (IR page 37): The District 9 Manager should ensure that all appropriate hazard complaints are entered into the Hazardous Condition Complaint database.

MSHA Response: MSHA will complete the following corrective actions by the projected milestone date:

1. Headquarters personnel will conduct training for Price Field Office personnel on the *Hazard Complaint Procedures Handbook* and use of the Hazardous Condition Complaint database.

Milestone: 11/01/2008

2. The District 9 Manager will ensure that all hazardous condition complaints are entered into the Hazardous Condition Complaint database.

Milestone: 11/01/2008

Recommendation No. 19 (IR page 38): The District 9 Manager should ensure that supervisory review of inspection notes and reports is thorough.

MSHA Response: MSHA will complete the following corrective actions by the projected milestone date:

1. District Management will conduct training for all supervisors to ensure supervisory review of inspection notes and reports is thorough. The requirements of the *Coal Mine Safety and Health Supervisor's Handbook* will be reviewed with all supervisors with special emphasis placed on field activity reviews and review of work products.

Milestone: 11/01/2008

2. The District Manager will provide the CMS&H Administrator with a memo confirming when this corrective action has been completed.

Milestone: 11/01/2008

Recommendation No. 20 (IR page 40): District 9 inspectors should be instructed on the requirements and importance of thoroughly reviewing operators' examination record books.

MSHA Response: MSHA will complete the following corrective actions by the projected milestone date:

1. District 9 inspectors will be instructed on the requirements and importance of thoroughly reviewing operators' examination books. The District Manager will issue a memo providing instructions to all supervisors and inspectors regarding this recommendation.

Milestone: 11/01/2008

2. The District Manager will provide the CMS&H Administrator with a memo confirming when this corrective action has been completed.

Milestone: 11/01/2008

Recommendation No. 21 (IR page 42): MSHA should establish policy that retreat mining should be observed, especially in areas that are bounce-prone and/or under deep cover, to evaluate whether the plan is adequate.

MSHA Response: MSHA has completed the following corrective actions:

1. CMS&H Administrator memo on "Corrective Measures for Inspection and Investigation Activities Related to Roof Control Plans and Related Miner Training" (CMS&H Memo HQ-08-055-A) issued on June 3, 2008, requires that all sections where retreat mining is occurring must be inspected at least monthly. The inspection will be conducted by a roof control specialist, as resources permit, or by a regular inspector at a minimum.

Milestone: Completed 06/03/2008

2. CMS&H Administrator memo "Approval of Complex and/or Non-typical Roof Control Plans and Amendments" (CMS&H Memo HQ-08-058-A) on June 5, 2008, instructs the districts to seek the assistance of MSHA's Technical Support Roof Control Division and that a site visit shall be made by District personnel where applicable.

Milestone: Completed 06/05/2008

Recommendation No. 22 (IR page 42): The Administrator should ensure that all districts are enforcing the requirements of 30 CFR § 75.223(b), and provide any necessary guidance (all roof falls and bounces).

MSHA Response: MSHA will complete the following corrective actions by the projected milestone date:

1. CMS&H will be issue provide guidance and instructions to enforce the requirements of 30 CFR § 75.223(b).

Milestone: 11/01/2008

Recommendation No. 23 (IR page 43): The District 9 Manager should ensure that valid respirable dust surveys are conducted in accordance with the *Coal Health Inspection Procedures Handbook*.

Recommendation No. 24 (IR page 43): The District 9 Manager should ensure adequate supervisory review of inspection activities.

MSHA Response: MSHA will complete the following corrective actions by the projected milestone date:

1. Field office personnel will be retrained and instructed on the requirements of the Coal Health Inspection Procedures Handbook during the next staff meeting.

Milestone: 11/01/2008

2. To ensure procedures are in place for adequate supervisory review of health-related inspection activities, the district will develop and implement SOPs for the Health Group, with priority given to the respirable dust sampling program and dust control plan approval process.

Milestone: 11/01/2008

3. The District Manager will provide the CMS&H Administrator with a bimonthly memo on respirable dust sampling for each mechanized mining unit until further notice.

Milestone: 11/01/2008

Topic: Emergency Response

Recommendation No. 25 (IR page 47): MSHA should respond to any mine emergency with the most knowledgeable personnel available. Contacts to Technical Support should be timely and accurate to allow for their quick response.

MSHA Response: We disagree with the implications contained in this section of the Independent Review (IR) report. The IR report states that "Two persons notably absent from the rescue operation were William Knepp and Billy Owens, both from the District 9 office in Denver." According to the District Manager, while Billy Owens was not on site and assigned to the rescue operation, he and the District Manager had numerous

discussions about the Crandall Canyon situation, the existing approved roof control plan, the plan approved during rescue operation, and the use of RocProp™. The IR report continues that “With his expertise, Owens may have been instrumental in evaluating the bounces that were occurring and determining whether the support system being used was adequate to protect personnel.” It should be noted that a number of District 9 personnel at the mine site were aware of prior instances in which RocProp™ had been dislodged; however, our experts believed that RocProp™ were the best protection available and that they could be used effectively by installing them on a closer spacing and reinforcing them by putting more cable ropes in place. By installing RocProp™ on two and one-half foot centers and supplementing with 3 wire ropes around the RocProp™, MSHA believed any additional bounces could be controlled. However, the August 16, 2007, failure showed the support was not adequate.

Technical Support was notified very shortly after Headquarters became aware of the accident. Initially, Technical Support was unsure what caused the accident; however, as additional information was obtained, it became apparent that this accident involved ground failure and assistance from Technical Support’s Roof Control Division was necessary. The Deputy Director of Technical Support was in the Headquarters Command Center and learned first-hand all available information as it became available from the mine. Once it was determined at about noon on August 6, 2007, that Technical Support personnel would be needed on site, arrangements were made immediately to transport them on the next available flight, which departed at 7 A.M. on August 7, 2007.

MSHA will continue to make every attempt to respond to any mine emergency as expeditiously as possible and deploy the most knowledgeable personnel available.

MSHA has completed the following corrective actions (or will complete by the projected milestone date):

1. CMS&H Administrator will issue a memo to District Managers directing them to respond to complex mine emergencies with the most knowledgeable person available.

Milestone: 11/01/2008

2. CMS&H will continue to notify the MEO unit as quickly as possible. Requests for assistance and information will be as detailed as possible.

Milestone: Completed

3. All Mine Emergency Operations handbooks will be updated to ensure adequate local and headquarters' coverage of all mine emergency events that may involve rescue and recovery operations.

Milestone: 01/01/2009

Recommendation No. 26 (IR page 47): MSHA should ensure that backup district managers are notified to respond to all future mine emergencies.

Recommendation No. 27 (IR page 47): MSHA should revise all mine emergency response procedures, both in Headquarters and the district offices, relating to responding to mine emergencies to include any accident where rescue and recovery operations are necessary, not just fires, explosions, or inundations.

Recommendation No. 71 (MERD) (IR page 123): MSHA should revise its policies and procedures to recognize that ground control failures, and any other events in which miners are trapped or missing, constitute mine emergencies that should be responded to in the same manner as fires, explosions, and inundations.

MSHA Response: MSHA will complete the following corrective action by the projected milestone date:

1. CMS&H Administrator will issue a memo that existing procedures will be augmented by instructing districts that mine emergencies can include events other than fires, explosions, and inundations and that backup district managers are to be notified when any possible emergency occurs. However, CMS&H may opt to utilize personnel other than, or in addition to, those listed.

Milestone: 11/01/2008

Topic: Central Command Center

Recommendation No. 28 (IR page 48): MSHA should develop a program to train persons-in-charge of rescue and recovery operations. This training should instruct participants in the organization and use of a single command center during mine rescue and recovery operations.

MSHA Response: The IR report states that "The command center will have communication equipment" for maintaining contact with the underground rescue workers. Established mine rescue protocol expands the command center communication requirement to also provide communications "to other surface phones." The entire paragraph on page 1-5 of *MSHA Instructional Guide Series (IG) 7* reads as follows: "The command center will have communications equipment connected to the underground phones and to other surface phones, along with mine maps for following the progress and for marking findings and figuring out strategies." (NOTE: The IR

Team (IRT) inadvertently left the “s” off communication when quoting the mine rescue protocol.) The communication protocol recognizes that at times it may be essential to communicate with areas other than the underground, e.g. warehouse, supply yard, hoist house, mine office(s), etc.)

In the case of Crandall Canyon, a single command center was used during traditional mine rescue team work underground, i.e. mine rescue team members conducting exploration and working with breathing apparatus. While ‘non-traditional’ mine rescue activities were ongoing, such as the loading out material that was blocking the mine entries to clear a path for subsequent rescue/recovery efforts, there were internal reasons for the separate entities to congregate in separate areas of the mine property. Each area was connected to the Central Command Center via mine pager phone, and communications with the underground workers were maintained at all times. The pager phones allowed both the mine operator and MSHA to monitor all communications between the Fresh Air Base and the surface. Underground inspectors reported issues requiring immediate attention as they arose and reported on other issues at established times from underground and at the surface borehole locations.

The Central Command Center was staffed 24 hours a day by a competent MSHA person. However, when ‘traditional’ mine rescue activities, such as exploration in by the Fresh Air Base was in progress, all entities assembled at the Central Command Center, where persons-in-charge directed the rescue and recovery operation.

Management representatives and MSHA personnel conducted meetings to discuss immediate needs when appropriate. Daily planning meetings were held twice a day to discuss future needs. MSHA maintained oversight of the operation at all times.

MSHA agrees that a single command center should be used when mine rescue teams are exploring underground, recognizing that a single command center may not be necessary at other times during non-traditional mine rescue activity.

MSHA is making major upgrades to its command and control equipment that will help to centralize the monitoring of all activities on site for the person-in-charge. Once complete, a training class will be developed and incorporated into the existing Mine Emergency Response Development (MERD) and mine fire preparedness modules available to senior management.

MSHA will complete the following corrective action by the projected milestone date:

1. CMS&H Administrator will send a memo to the Director of Technical Support requesting assistance with the development and deployment of MERD Training.

Milestone: 01/01/2009

2. MSHA will conduct training for persons-in-charge about the organization and use of a command center during mine rescue and recovery operations.

Milestone: 01/01/2009

Topic: Person-In-Charge

Recommendation No. 29 (IR page 50): The Assistant Secretary should establish a policy that clearly identifies who will be in charge of the mine emergency operation when an MSHA official more senior than the District Manager is on site.

MSHA Response: MSHA's management organization delegates responsibility and authority for all activities within geographic districts to the District Manager. MSHA's senior managers are responsible for providing guidance, assistance, support and oversight of District Managers and activities within the districts. This management structure neither changes during a mine emergency nor does it change depending on the physical location of MSHA's senior managers. Regardless of the delegation of responsibility, ultimately the Assistant Secretary for MSHA takes responsibility for all results of the Agency.

MSHA's Headquarters Mine Emergency Response Guidelines (Handbook Number: AH08-111-2) states:

"Each district maintains an up-to-date Mine Emergency Response Plan that outlines the duties and responsibilities of district personnel during a mine emergency. The headquarters procedures in this handbook complement the district plans. These procedures address the responsibilities of MSHA Headquarters and selected field organizations in dealing with a major mine emergency and the interrelationships between Headquarters and the district office, Congress, and the public. **The procedures do not direct headquarters officials to oversee rescue and recovery activities at a mine.**"

In the case at Crandall Canyon the District Manager was in charge of the rescue operation. He assigned and supervised shift supervisors, who in turn, assigned and supervised MSHA employees who monitored the work sites on each shift to ensure that approved plans, the Mine Act, MSHA's standards, and safe job procedures were followed. The District Manager, and those to whom he delegated responsibility, worked diligently to carry out MSHA's responsibilities during the rescue operation. They manned the Command Center, fresh air base, work sites, and the family center. They conducted planning meetings with the mine operator, and reviewed and approved the operator's rescue plans. They took steps to assure that security was maintained at the mine site and family center.

MSHA's Assistant Secretary and CMS&H Administrator were at the mine site during portions of the rescue operation and attended meetings with the press and the trapped miners' families. They provided guidance, assistance, support, and oversight of the rescue operation. The IR report does not cite any cases where confusion about who was in charge affected the rescue operation and we are not aware of any cases where it did. There was no confusion among those who were making decisions. The decisions that included consultation of MSHA's senior management were consensus decisions. In order to help prevent any misinterpretation of MSHA's management structure and delegation of responsibility when senior MSHA officials are at a mine emergency, this will be clarified via memo, the *Mine Emergency Response Handbook*, Mine Emergency Response Plans (MERP), and covered in training provided to all managers and supervisors.

1. Training will be provided through a series of MERD exercise. This will be an ongoing process, the first conducted prior to 01/01/2009.

Milestone: 01/01/2009

2. MSHA will issue a memo to the District Managers that clearly identifies who will be in charge of the mine emergency operation when an MSHA official is more senior than the District Manager on site.

Milestone: 11/01/2008

3. The *Mine Emergency Response Procedures Handbook* will clarify MSHA's management structure and delegation of responsibility when senior MSHA officials are at a mine emergency.

Milestone: Completed 02/27/2008

Recommendation No. 30 (IR page 50): The sole responsibility of the person-in-charge of a mine rescue or recovery operation should be to direct and oversee the overall rescue or recovery operation.

MSHA Response: The home district manager will be responsible for the rescue/recovery operation in most cases - rotating with other qualified individuals assigned to that function. The home district manager and his/her staff possess detailed knowledge of the mine and mine personnel. Where practical, the sole responsibility of the person-in-charge will be to direct and oversee the mine rescue or recovery operation. The duties of the primary communicator will be assigned to a separate qualified individual and the functions of family liaison will be performed by persons from the pool of individuals trained to interact and communicate with miners' families. However, it must be recognized that this delineation of roles and responsibilities may

be impractical, especially during the initial stages before additional support personnel arrive.

MSHA will complete the following corrective action by the projected milestone date:

1. The home district manager will be responsible for the rescue/recovery operation in most cases – rotating with other qualified individuals assigned to that function. This recommendation will also be addressed in the CMS&H Administrator memo that is responsive to IR Recommendation No. 68.

Milestone: 11/01/2008

Topic: Communications (Briefings & Debriefings)

Recommendation No. 31 (IR page 55): MSHA should develop a program to train personnel in charge of rescue and recovery operations. This training should include how to ensure that formal briefings and debriefings are conducted with all personnel involved. Persons-in-charge should be trained on how to create an atmosphere that promotes open communication.

MSHA Response: MSHA concurs that formal briefings and debriefings are vital during underground mine rescue work. However, there were very few times when apparatus wearers were actually involved. MSHA did not feel the formal briefing and debriefing of each person working underground was needed before and after each shift during the load out process. There were always three MSHA inspectors involved in the load out process. They typically rotated their duties while underground. While some of them had mine rescue experience, this was not a prerequisite to take air readings and monitor the load out process. In MSHA's opinion, there was sufficient discussion of the work assignments. The general plan for the underground operations to load out the material in the No. 1 entry never changed between August 8 and August 16. It was to load out the material in the No. 1 entry. MSHA believes that persons-in-charge received all material information from those participating in the rescue effort and that those participating in the rescue effort were provided with the material information that was available to persons-in-charge.

MSHA disagrees that MSHA's roof control specialists from Technical Support were never clearly briefed or debriefed. They were brought to the site for their roof control expertise. They were to evaluate the conditions and give their recommendations as to what could safely be done to advance into the South Barrier Section. They were part of the plan revision decision-making to include the RocProp™ as a support. They were asked for updates when they came out of the mine as well as being asked for their opinions on conditions and advice.

An emergency such as Crandall Canyon is a very stressful and emotional situation with many things occurring concurrently. Consequently, the Command Center shift supervisor was the conduit of critical, important and routine information related to the rescue activity. MSHA personnel assigned duties outside of the Command Center were expected to report to the Command Center shift supervisor at the start and end of their shifts for exchange of information. MSHA's expectations were that critical information was to be immediately reported to the shift supervisor of the Command Center, important and regular updates of information were also to be provided to the shift supervisor of the Command Center.

In turn, the Command Center shift supervisor immediately reported critical information to the District Manager and relayed all important information to the family liaison at the family center and to the National Command Center in Arlington. All important information that was received by the Command Center shift supervisor was to be recorded in the Command Center log book by the scribe who was assigned to that duty during each shift.

MSHA is not aware of personnel who were denied the opportunity to discuss additional concerns. Each of the inspectors had the opportunity to stop at the Command Center and communicate their concerns. The majority of personnel took advantage of this opportunity. In addition, while there was certainly tension between the mine operator and MSHA, it did not affect the communication at the mine site when determining and implementing plans.

The Assistant Secretary did not fire, threaten to fire or to reassign anyone during the rescue operation. The District Manager did reassign MSHA employees during the rescue operation to best utilize their individual skills to achieve the priorities at the rescue site and within the district. The IRT's concerns may result from a misunderstanding by personnel of these reassignments during what was an innately stressful situation.

MSHA will complete the following corrective actions by the projected milestone date:

1. Training will be provided through a series of MERD exercises. This will be an ongoing process, the first conducted prior to January 1, 2009.

Milestone: 01/01/2009

Topic: Transportation

Recommendation No. 32 (IR page 55): Persons-in-charge should ensure that MSHA personnel have transportation to the affected area when a rescue or recovery operation is ongoing.

MSHA Response: MSHA is aware of discrete instances in which inspectors had trouble getting transportation into and out of the mine at times. The majority of occurrences where this happened were after August 16, 2007, when no rescue activities were ongoing but inspectors were still kept underground on each shift. The District Manager repeatedly discussed this with the mine operator. The mine operator did not always provide transportation. MSHA made every attempt to get transportation in a reasonable and timely fashion.

MSHA will complete the following corrective actions by the projected milestone date:

1. The Office of the Solicitor (SOL) will provide guidance regarding the legal issues associated with this recommendation.

Milestone: 01/01/2009

2. This will be included in training to be provided through a series of MERD exercises. This will be an ongoing process, the first conducted prior to 01/01/2009.

Milestone: 01/01/2009

Topic: UG Phone Communications

Recommendation No. 33 (IR page 57): MSHA should develop a program to train personnel in charge of rescue and recovery operations, which would include establishment and security of communication systems.

Recommendation No. 34 (IR page 57): The command center should ensure communications are established and maintained to the fresh air base before underground rescue operations are allowed in by that point.

MSHA Response: CSMH Memo No. HQ-07-094-A, dated August 24, 2007, contained instructions for command center security. The instructions discuss the importance of, and possible methods for, providing communication security. However, these instructions apply to the operation of a command center which would only be in place when mine rescue teams were exploring underground areas of the mine. This was not the case at Crandall Canyon where mine rescue team exploration was not occurring.

It should be recognized that underground communication systems are designed to provide easy and unlimited access, and it may not be practical to absolutely ensure security of the system. During the first two days after the accident, the operator had operational difficulty at times maintaining the communication hardware to the fresh air base. This was corrected as soon as practicable considering other priorities at the time. Therefore, it is important to recognize the difference between a traditional mine rescue

team operation – as opposed to the activities at Crandall Canyon. Command center security, during mine rescue team operations, will be reviewed during training to be provided through a series of MERD exercises. This will be an ongoing process; the first conducted prior to January 1, 2009. MSHA will complete the following corrective action by the projected milestone date:

1. Training will be provided through a series of MERD exercises. This will be an ongoing process, the first conducted prior to January 1, 2009.

Milestone: 01/01/2009

Topic: Ground Support System Used

Recommendation No. 35 (IR page 64): MSHA should develop a program to train personnel in charge of rescue and recovery operations. This training should address the importance of soliciting and utilizing the experience and expertise of all pertinent resources, especially concerning technical issues.

MSHA Response: MSHA’s employees are trained to solicit and utilize the experience and expertise of all pertinent resources, especially concerning technical issues. Furthermore, MSHA Technical Support’s (TS) Roof Control Division (RCD) personnel, who were on site, contacted a NIOSH expert on standing ground support for his recommendations on ground support during the rescue operation; this expert endorsed the use of RocProp™. Additionally, suggestions with any potential value were sent to TS personnel on site to be considered for use in the rescue effort. It is TS policy to follow up on all incoming suggestions and to evaluate all such input, no matter the source, for possible technical merit and usefulness during a mine emergency. However, TS personnel were unaware of the angled-base bracket recommendation noted in the IR report. In the days and weeks following the Crandall Canyon accident, RCD personnel on site during the Crandall Canyon Mine rescue operation as well as TS personnel in Pittsburgh and MSHA Headquarters responded to many suggestions received in person, via phone and via email.

MSHA will complete the following corrective action by the projected milestone date:

1. Training will be provided through a series of MERD exercises. This will be an ongoing process, the first conducted prior to January 1, 2009.

Milestone: 01/01/2009

Topic: 103k Orders

Recommendation No. 36 (IR page 67): The Administrator should establish clear guidance concerning the issuance of verbal § 103(k) orders. District MERPs should be revised to reflect such guidance.

Recommendation No. 37 (IR page 67): MSHA should establish policy which outlines a mine operator's ability to continue with activities toward rescue or preservation of life and property if a verbal § 103(k) order is issued.

Recommendation No. 38 (IR page 69): MSHA should ensure compliance with orders issued under section § 103(k) of the Act.

Recommendation No. 40 (IR page 70): MSHA should ensure compliance with orders issued under section § 103(k) of the Act.

Recommendation No. 42 (IR page 72): MSHA should develop a program to train personnel in charge of rescue and recovery operations. This training should include the provisions and authority of exercising a § 103(k) order and the plan approval process for allowing work to be performed.

Recommendation No. 47 (IR page 89): MSHA should request legal advice from the Office of the Solicitor (SOL) which clarifies the Agency's authority, responsibilities, and liabilities under § 103(k) and § 103(j) orders.

MSHA Response: The District Manager, and those under his direction and supervision, modified the § 103(k) order and operational plans as they believed appropriate for control of the rescue operation. The District Manager did not believe that the outby activity necessary to support the rescue effort -- such as maintaining the conveyor belt haulage system, water distribution system, and supply delivery system -- presented safety concerns that would merit inclusion in the § 103(k) order. Senior MSHA officials on site concurred with the District Manager's decisions.

MSHA has completed the following corrective actions (or will complete by the projected milestone date):

1. Existing instructions are that a 103(k) order is to be issued as soon as possible upon learning of a mine emergency - along with initial instructions. Whether issued by telephone or in-person, the operator's allowable actions are discussed as a part of the initial instruction when the 103(k) order is issued. The written procedure also instructs that the order be reduced to writing and served as quickly as practicable.

Milestone: Completed 08/24/2007

2. CMS&H Administrator will issue an instructional memo to District Managers to review the district MERPs for consistency with existing guidance by November 1, 2008.

Milestone: 11/01/2008

3. Training will be provided through a series of MERD exercises. This will be an ongoing process, the first conducted prior to January 1, 2009. SOL will provide guidance regarding the provisions of § 103(j) and § 103(k), including a discussion of MSHA's authority, responsibility and potential for liability.

Milestone: 01/01/2009

Recommendations No. 39 (IR page 69) and 41 (IR page 70): MSHA should not allow anyone who is not directly related to a rescue or recovery operation to be in the affected area.

Recommendation No. 43 (IR page 72): MSHA should not allow persons unnecessary to the rescue and recovery operation to enter the affected area.

MSHA Response: MSHA supports the general principles of these recommendations but believes the actions at Crandall Canyon comported with these principles. MSHA modified the § 103(k) order on August 7, 2008, to allow the use of cameras underground to take pictures for the purpose of informing the families, and the Agency believed that it was not necessary to issue an additional modification for the media to take pictures on August 8, 2008. It is believed that the pictures were worth a thousand words in helping the families, some of whom did not speak English fluently, understand the conditions and extraordinary work at the underground rescue site. The use of the media to take pictures underground is not unlike what is allowed of media in covering military deployments overseas, which is designed to help families and the public understand the difficulties that are faced.

The two family members who went in the mine were experienced underground miners; one also was an experienced member of an active mine rescue team and possessed extensive mine rescue knowledge. One family member who went underground also spoke Spanish. Both of these individuals were instrumental in explaining the rescue activity to family members. They also provided suggestions regarding the rescue activity and were considered part of the rescue effort.

MSHA has completed the following corrective actions (or will complete by the projected milestone date):

1. CMS&H Administrator issued a memo "Mine Emergencies" (CMS&H Memo HQ-08-056A) on June 3, 2008, that outlines the security arrangements that should be in place to control access to the mine site. It further elaborates that "MSHA should ensure that only appropriate parties are granted access to the mine site and surface areas."

Milestone: Completed 06/03/2008

2. Training will be provided through a series of MERD exercises. This will be an ongoing process, the first conducted prior to January 1, 2009.

Milestone: 01/01/2009

Recommendation No. 44 (IR page 72): MSHA should ensure that an adequate system of check-in and check-out is established and followed during a mine emergency.

MSHA Response: It is the mine operator's responsibility to establish an effective check in/check out system. The mine operator was required to deliver the check in/check out sheets to the command center on a regular basis. The District Manager had set specific deadlines to ensure this was being done. When MSHA found the system to be inadequate, they directed the mine operator to correct the problem.

MSHA will complete the following corrective action by the projected milestone date:

1. Training will be provided through a series of MERD exercises. This will be an ongoing process, the first conducted prior to January 1, 2009.

Milestone: 01/01/2009

Topic: Rescue Attempt (Mine Rescue Teams)

Recommendation No. 45 (IR page 77): MSHA should develop a program to train personnel in charge of rescue and recovery operations, including the principles of mine rescue protocol.

MSHA Response: MSHA filled the newly created position of Mine Emergency Operations (MEO) Manager on June 24, 2007. The MEO Manager is the coordinator for the Mine Emergency Unit (MEU) teams but is not, as the IR report erroneously states, "responsible for all mine rescue operations for MSHA." As defined in the position description, the MEO Manager is responsible for "the allocation and deployment of mine rescue and recovery personnel" and during a mine emergency, "... acts as the agency's subject matter expert and provides guidance to the District Manager (DM) in the decision making process."

Coal Mine Safety and Health maintains three highly-trained and well-prepared Mine Emergency Unit (MEU) teams. The teams receive intensive training throughout the year and have been instrumental in the rescue and recovery efforts at many mines over the years. The team members serve on National Committees responsible for promulgating, designing and implementing mine rescue laws and national mine rescue

competition rules. They serve as their respective CMS&H District's subject matter expert relating to mine rescue. These teams and team members are strategically located throughout the United States so that they may quickly respond to any mine emergency. In the case of Crandall Canyon, team members from each of the three MEU teams promptly responded to assist in the rescue and recovery operation.

Mine rescue protocol is an important element of mine rescue and recovery operations as teams explore inby an established Fresh Air Base (FAB). The established protocol should be understood and strictly followed as teams advance into unexplored areas inby the FAB. However, there are times during rescue and recovery operations that work and tasks must be performed in order to advance the actual mine rescue team exploration. In the case of Crandall Canyon, the loading of material in the mine entries to provide an exploration route for mine rescue personnel was a necessary adjunct to the advancement of the mine rescue operation. While this work was being done, actual mine rescue protocol may not have applied. However, there was very little deviation from the protocol and any such deviation was intended to achieve a defined objective without putting those working underground in any additional danger.

During the loading of the material, an underground point of communication was established much like that of a FAB. The safety of those performing the underground loading activities was the top priority and their progress was being closely monitored. Communications from the surface to the underground work areas was maintained and monitored at all times. The rate of advance was charted on a mine map which was kept current. While the work of providing a clear path to continue the rescue efforts was taking place, strategic planning sessions continued on the surface to consider all remaining options for reaching the last known work location of the trapped miners.

MSHA has completed the following corrective actions (or will complete by the projected milestone date):

1. MSHA created the position of Mine Emergency Operations Manager. The incumbent serves as the technical authority, logistical and subject matter expert on all MSHA mine emergency responses. In this capacity, he coordinates mine atmosphere analysis and the Mine Emergency Unit (MEU) and the Mine Emergency Technology Team (METT), the allocation and deployment of mine rescue and recovery personnel, and arrangements for special transportation needs (Air Force Deployment). He provides guidance to the District Manager in the decision-making process. This position was filled on June 24, 2007.

Milestone: Completed 06/24/2007

2. MSHA will evaluate MERDs and mine fire preparedness exercises and other training modules to ensure that comprehensive coverage of mine rescue protocol

and procedures is provided especially concerning the conduct of necessary adjunct activities which help advance the mine rescue operation, such as material loading. CMS&H will evaluate training records to ensure appropriate senior district personnel receive this training. This will be an ongoing process.

Milestone: 01/01/2009

3. Mine rescue protocol should be followed when mine rescue teams are exploring underground. However, when teams are not exploring, mine rescue team protocol may not be applicable. Training will be provided periodically through a series of MERD exercises. This will be an ongoing process, the first conducted prior to January 1, 2009.

Milestone: 01/01/2009

Topic: Rescue Attempt (Explorations)

Recommendation No. 46 (IR page 81): MSHA should obtain all relevant information prior to determining whether to continue or discontinue any rescue or recovery attempt.

MSHA Response: We disagree that MSHA did not obtain all relevant information from persons involved in the excursions when making the decision to not proceed further over the top of the rubble in the collapsed tunnels. While formal debriefings were not held, all of the inspectors involved in four excursions had discussions with MSHA persons in charge after returning to the surface. However, additional exploration over top of the rubble without any additional roof support and ventilation presented a significant risk to the rescue workers. Rescue operations in an underground coal mine are inherently dangerous and particularly where there has been a prior bounce and seismic activity continues, and mine rescue protocols dictate that the safety of the rescuers is always a primary concern in any rescue. The overall risk of continued exploration in crawlways over the rubble was determined to be unacceptable and was highly unlikely to be successful for the following reasons:

- There was no way to determine whether a subsequent bounce would completely fill any existing void. Some of the rubble in the entries came from floor heave which can be progressive and could close any existing void.
- The roof was also fractured and had fallen in some portions of the bounce area. Without supporting the roof, rescuers could be struck by falling material from the roof at any moment.
- Dangerous air conditions from low oxygen were an additional concern. There was no way to install ventilation controls to take fresh air with the rescuers and wearing bulky breathing apparatuses significantly limits travel capabilities. It was also known

that subsequent bounces had forced oxygen deficient air outby, implying that the air quality may decline as one further explored over the rubble.

- It would have been extremely difficult to assist rescuers who were overcome from low oxygen or injured in a narrow space over the top of rubble. The likely complications from an accident during extensive exploration over the rubble would have substantially delayed overall rescue efforts.
- The fact that boreholes at times exhausted air depending on atmospheric changes indicated that there was not an open passage between the area where the miners were last known to be and the return air course at crosscut 126. As such, available evidence suggested that there was a complete blockage to prevent any air circulation between the borehole location and the outby area.
- Crosscut 126 was about 1800 feet from the last known location of the trapped miners. It was highly unlikely that there was a travel way or that rescuers could crawl approximately 1/3 of a mile safely over the rubble without unacceptable risk, particularly in light of the scale of the original bounce and potential continuing seismic activity.

The MSHA persons-in-charge had to take into account all of these various factors during the rescue attempt. The consensus was to continue the load out operation in the No. 1 entry with the RocProp™ support. This approach is consistent with the prudent and fundamental mine rescue protocol, which dictates in all cases that the safety of the rescuers is always the first priority in any rescue and/or recovery event.

The strategy for reaching the missing miners was a two-prong rescue approach. The first was to physically reach them through the underground mine entries. The second was to continue drilling a series of strategically surveyed boreholes to attempt to communicate with the trapped miners and to evaluate the mine atmosphere in the locations where the miners were presumed to be located. Both elements of the rescue strategy continued simultaneously with the possibility of finding the miners alive. Even though the atmosphere readings obtained through some of the boreholes indicated oxygen levels insufficient to support human life, the hope of finding the miners alive continued to be a motivating factor in continuing the rescue attempts. There have been cases in successful mine rescue events where the atmosphere and/or conditions in the areas where the trapped miners were presumed to be located could not have supported human life. For example, during the Quecreek rescue operation, the water levels according to the underground mine elevations in the last known location of the trapped miners indicated the water would have reached the mine roof and the miners would have drowned. However, during the entire rescue effort, the miners were presumed to be alive and all rescue attempts continued.

Considerations were also given to other avenues such as tunnel liners, some type of boring machine, as well as driving a rock tunnel slope through Joe's Valley into the top

end of the South Barrier bleeder system. Each analysis of the possible options conducted by the Command Center demonstrated that the risk outweighed the value.

The possibility that the missing miners at Crandall Canyon were still alive was the driving factor in the decision-making of those who were considering the possible safe avenues of reaching the trapped miners. However, because the safety of the rescuers would have been significantly jeopardized by doing so, further exploration over the coal rubble was no longer considered a safe and viable option.

Milestone: Not applicable

Topic: Rescue Attempt (Boreholes)

Recommendation No. 48 (IR page 89): MSHA should have a contingency plan in place whereby equipment and other resources can be quickly and easily acquired to continue with a rescue or recovery operation if the operator cannot or will not provide necessary resources.

MSHA Response: MSHA will complete the following corrective action by the projected milestone date:

1. MSHA will explore the feasibility of the concept with Administration & Management (A&M) and SOL recognizing that some obstacles, such as hiring, training or contracting a large labor force and a multitude of services during a mine emergency, may make the concept unworkable.

Milestone: 01/01/2009

Topic: Risk vs. Value

Recommendation No. 49 (IR page 98): MSHA should develop a program to train personnel in charge of rescue and recovery operations. This training should include how to use all relevant information available to evaluate the level of acceptable risk compared to the value that will be obtained.

MSHA Response: We disagree that MSHA did not properly evaluate risk in light of potential value. MSHA continually evaluated risk versus value as reflected by many of the decisions made during the rescue operation. At every step, the safety of the mine rescue workers was considered paramount. Examples where MSHA conducted risk versus value included: decisions on excursions over the coal rubble, the breaching of the Main West seals, the cessation of the No. 4 entry clean up, the determination not to send any rescue personnel into the mine through the rescue capsule, and the support installed in the No. 1 entry to load out material. Additional exploration over top of the rubble ahead of any additional support and ventilation presented a significant risk that was determined to be unacceptable and was highly unlikely to be successful.

Consequently, MSHA believed the risks were too great for more aggressive movement in the excursions over the rubble.

Company and MSHA officials were concerned about the bounce activity at Crandall Canyon and the uniqueness of the rescue operations since the rescuers would be mining through bumped coal. The operator's engineering office was in contact with the University of Utah and they kept track of the location of the bounces and informed MSHA personnel on the bounce activity. In addition, MSHA conducted seismic monitoring as part of an effort to initially obtain any and all information possible and then determine its usefulness. Typically, bump predictive techniques are developed through experience at a given mine site and are very site-specific. There have been situations where an increase in seismic activity has been a precursor to a bump. Conversely, other mines have experienced a lull in seismic activity before an event. Recent analysis of the seismic data gathered by the University of Utah for the days leading up to the August 16th event, revealed no predictive value.

Regarding training on risk analysis, there is no recognized, formal quantitative method to analyze risk versus value for mine emergencies. Each emergency is completely unique, and what has historically been used to evaluate all relevant information to make key decisions has been a combination of gas analysis on-site trends, subjective expert opinions and the MSHA knowledge base gained from years of mine emergency response experience. This knowledge gained over time is reflected in MERD exercise training, and lessons learned are valuable training tools. Nevertheless, MSHA is currently exploring participation with the National Academy of Sciences in a workshop to discuss the use of state-of-the-art quantitative risk analysis methods used in other industries for application to mine emergency situations.

As stated in item 46 and without benefit of hindsight, persons onsite continually evaluated and discussed risk versus value factors and considered all available information. Risk versus value factors were considered and critical discussions were held among MSHA's decision-makers with input from technical experts, experienced members of mine management and safety professionals, and MSHA personnel. An undesirable outcome does not prove that risk/value was not considered.

MSHA will complete the following corrective actions by the projected milestone date:

1. MSHA will work with the Interagency Working Group established by NIOSH under the MINER Act to determine whether and how research efforts should focus on evaluation of risk versus value factors during mine emergency rescue operations.

Milestone: Ongoing

Topic: Mine Emergency Operations (Equipment)

Recommendation No. 50 (IR page 101): MSHA should evaluate and update, as needed, the mine emergency equipment. The seismic location system should be modernized, which was also identified in the report for the Sago Mine explosion.

MSHA Response: The MSHA Seismic Location System is designed for search and rescue of trapped miners and has been used for over 35 years. The system is truck mounted and is stationed at MSHA's Mine Emergency Operations (MEO) facilities located in Bruceton, Pennsylvania. The system has the capability of locating miners up to 1500 feet, and can detect signals from 2000 feet underground, under very low seismic noise conditions. While functional, the current system is based upon very dated technology. Improvements have been made to the system since it was initially developed. This includes upgrades to the computer systems, a re-write for software programs, replacement of trucks, and replacement of system generators.

Following the Sago mine accident in January, 2006, MSHA issued a Request for Information (RFI) that sought comments, data and other information on topics relevant to underground mine rescue equipment and technology. Included in the RFI was a request to identify Rapid Deploy Systems which are easily transportable for use in mine emergencies and can be quickly set up to provide emergency service. An example was a seismic sensing system for detecting movement underground or signals transmitted by trapped miners.

Another RFI was issued in 2007 utilizing specifications developed by Technical Support, for a Rapid Deployable Seismic Location System. The responses to the RFI indicated that there is no off-the shelf seismic system that could meet MSHA specifications.

MSHA decided to upgrade the existing system, while pursuing research efforts with NIOSH. NIOSH has an in-house project for the development of a rapid deployable seismic system that can detect signals from trapped miners, but unfortunately not yet locate them. Tests are being conducted this year.

MSHA will complete the following corrective action by the projected milestone date:

1. MSHA Technical Support will continue to investigate new technology to modernize the seismic equipment and update MEO equipment as needed.

Milestone: Ongoing

2. MSHA will continue to work with the Interagency Working Group established by NIOSH pursuant to the MINER Act on research efforts toward the development of an improved seismic system.

Milestone: Ongoing

Recommendation No. 51 (IR page 101): Equipment should be field tested, and documented, on a regularly scheduled basis to ensure its readiness and usability during an emergency.

MSHA Response: In 2000, Technical Support decided that regular field tests of the Seismic System were not needed as long as regular monthly systems tests were conducted at the MSHA Bruceton facility. Funds that would have been used for field tests were used to upgrade system components, perform maintenance, and purchase other MEO/MEU equipment including new breathing apparatus for the MEU.

The satellite communications equipment from equipment caches were the most reliable communications capability at Crandall Canyon. The reason the vehicle-mounted radios had to be moved at the drill locations was to get out of the way of dozers and other drilling related equipment. MSHA inspectors needed to get to a point of safety when calling in the drilling progress reports, and avoid delaying operations. Portable, hand-held satellite radios were not reliable, even from the top of the mountain.

Maintenance and functional testing of MEO equipment has been performed routinely in the past. MSHA Technical Support will develop a formal schedule for appropriate field-testing and maintenance of all MSHA MEO equipment.

MSHA has completed the following corrective actions (or will complete by the projected milestone date):

1. MSHA Program Evaluation and Information Resources purchased all new satellite phones and procured new service agreements.
2. MSHA Technical Support will develop a schedule for testing and maintenance of MEO equipment.

Milestone: 01/01/2009

Topic: Mine Emergency Operations (Information)

Recommendation No. 52 (IR page 101): Location of equipment caches should be listed in the Headquarters and Districts Mine Emergency Response handbooks. This cached equipment should be tested regularly, with results documented.

MSHA Response: A 2007 nationwide audit of cached equipment is currently being updated. The locations of MEO equipment caches will be shown in District and Headquarters MERPs after the Technical Support (TS) audit is completed. TS will work

with CMS&H personnel at the District cache locations and recommends that the Districts check the functionality of their cached equipment monthly; TS will arrange to audit annually, and document results.

MSHA will complete the following corrective action by the projected milestone date:

1. The locations of MEO equipment caches will be shown in district MERP after the Technical Support reviews of cached equipment are completed and implemented.

Milestone: 01/01/2009

2. Technical Support will work with CMS&H personnel at the district cache locations and Districts will check the functionality of their cached equipment monthly; TS will arrange to audit annually, and document results.

Milestone: 04/01/2009

Recommendation No. 53: The *Mine Emergency Operation Telephone Book* and *Headquarters Mine Emergency Procedures Handbook* should be updated as necessary to reflect changes in personnel and procedures.

MSHA Response: MSHA will complete the following corrective action by the projected milestone date:

1. MSHA PEIR and Technical Support established a schedule to regularly update the handbook and the telephone book. The handbook was last updated February 28, 2008. The telephone book was revised on July 22, 2008. These revisions were made to reflect recent changes in personnel and procedures.

Milestone: Completed 07/22/2008

Recommendation No. 54 (IR page 102): MSHA should update the *Mine Rescue Teams Nationwide* database regularly, and at least annually.

MSHA Response: MSHA will complete the following corrective action by the projected milestone date:

1. MSHA Technical Support, Program Evaluation and Information Resources, and Educational Field Services will update the database at least annually. The database is currently updated annually, with the last update in May 2008.

Milestone: First annual update completed. Ongoing.

Topics: Family Liaison and Primary Communicator

Recommendation No. 55 (IR page 105): Liaisons should be provided annual re-training, and should also participate in annual MERD exercises.

MSHA Response: We disagree that family liaison training should be provided annually. While MSHA respects the Independent Review Team's opinion, the report did not appear to provide a basis for this recommendation. Existing training provided by NTSB is primarily intended for newly assigned liaisons. Inquiries will be made to identify further training that may be useful for current liaisons. Retraining will be conducted as necessary but not necessarily on an annual basis. Additional family liaisons are scheduled for training in August 2008 which will increase the number of trained persons in the pool. Family liaisons ordinarily participate in district MERD exercises. However, MSHA will complete the following corrective action by the projected milestone date:

1. MSHA will provide additional family liaison training and future MERD exercises as described previously.

Milestone: 01/01/2009

Recommendation No. 56 (IR page 105): MSHA should provide Family Liaisons with similar identifying apparel or other effective means to identify them as MSHA employees. MSHA should evaluate providing identifying apparel to all personnel at a mine emergency operation.

MSHA Response: MSHA will complete the following corrective action by the projected milestone date:

1. MSHA has ordered distinctive arm bands to assist in identifying family liaisons for families; these arm bands will be made available to family liaisons as soon as the shipment is received. MSHA inspection personnel are currently identified at mine sites by distinct clothing and hard hat labeling.

Milestone: 11/01/2008

Recommendation No. 57 (IR page 106): Consistent with the Miner Act, MSHA should be the primary source of all information shared with family members during mine emergencies.

MSHA Response: As stated on page 104 in the IR report, MSHA's family liaisons remained with the families 24 hours per day:

“Liaison responsibilities included contacting the MSHA command center each hour to obtain the latest data concerning progress of underground and surface rescue operations. Underground information addressed how rescue efforts were progressing, significant occurrences, mine air content, measurements of how far the rescue team had advanced, and the distance that roof supports had been installed since the last report. Surface operation reports included data pertinent to the depth of boreholes, as well as when the boreholes were expected to penetrate the coal bed. The reports also provided information on borehole samples with regard to gas readings for oxygen and carbon monoxide content. In addition, there were updates as to when a camera or microphone would be lowered into a borehole. This information was provided to family members in written form on a “white board” that was displayed where family members could review it at any time. The Liaisons informed family members that they (the Liaisons) were available to answer any questions or concerns related to the accident.”

The First Amendment to the U.S. Constitution recognizes an individual’s rights to free speech, and the mine operator exercised that right to speak with the families twice per day for about 30 minutes each time. MSHA senior officials spent an equal amount of time providing information and additional time, up to an hour after the meetings, answering family members’ questions. MSHA family liaisons spent 24 hours a day with the families posting hourly update information and answering their questions. MSHA fully fulfilled its obligations as the primary source of information shared with family members during the Crandall Canyon rescue effort.

MSHA will complete the following corrective action by the projected milestone date:

1. Advice will be obtained from SOL regarding MSHA's authority to prevent mine operators from independently releasing information to families – particularly at offsite locations. While being mindful of a person’s First Amendment rights to speak, MSHA will take steps to address the IRT’s recommendation to the extent legally and practically possible. MSHA provide information to families through its trained family liaisons and at times, senior MSHA officials may provide family briefings.

Milestone: 01/01/2009

Recommendation No. 58 (IR page 107): MSHA should clarify or revise the policy to definitively state who will conduct the family briefings for MSHA in a mine emergency.

MSHA Response: MSHA Program Policy Letter No. P06-V-11, dated December 22, 2006, sets forth policy and guidance whereby MSHA will establish family liaisons to serve as the primary communicators with families of mine accident victims. The designated family liaisons will make arrangements to meet with family members and remain accessible to them throughout the emergency. MSHA feels it is appropriate at times of emergencies that are not resolved in a short period of time to have senior MSHA officials meet with the families and answer family questions.

At Crandall Canyon, the MSHA policy was followed with 24-hour family liaison presence to assist and attend to the needs of the families. The independent review report references instances where other upper MSHA management, in addition to the designated family liaisons, also met with the families and provided informational briefings. These instances did not replace the designated family liaison personnel, but rather enhanced the attention and care given the affected families and provided the most current information available.

The IRT's assertion that senior MSHA officials assumed the duties of the family liaison is not accurate. Rather, MSHA's senior officials merely supplemented and enhanced the attention MSHA liaisons provided the families. In MSHA's opinion, it is inconsistent to suggest that senior MSHA management should not address families when they are on site, while suggesting that it is appropriate for senior MSHA management to address the press on a regular basis. It is fair to presume that family members will want to hear from senior MSHA officials should they be on site.

MSHA's established policy is that family liaisons provide a continuous source of information to families and are primarily responsible for this function. However, MSHA retains the option of permitting families to meet with senior MSHA officials as may be reasonable and appropriate.

Milestone: Completed 12/22/2006

Recommendation No. 59 (IR page 107): MSHA should develop a contingency plan on how they will handle family briefings during mine emergencies if company officials or any other party interferes with MSHA's responsibility of being the primary source of information for families.

Recommendation No. 60 (IR page 107): MSHA should request a legal opinion from the Office of the Solicitor regarding MSHA's authority at the location of the family briefings if they are held off mine property.

MSHA Response: MSHA will complete the following corrective action by the projected milestone date:

1. Advice will be obtained from SOL regarding MSHA's authority to 1) prevent mine operators or others from interfering with the agency's role as the primary source of information to families and 2) for actions that MSHA may take to effectively serve as the primary source of information to families, particularly at briefings off mine property. While being mindful of a person's First Amendment rights to speak, MSHA will take steps to address the IRT's recommendation to the extent legally and practically possible.

Milestone: 01/01/2009

Recommendation No. 61 (IR page 109): Family members should be given clear and accurate information associated with events surrounding an accident. All information relating to missing or trapped miners should, to the extent possible, be verified before the information is shared with family members or made public.

MSHA Response: MSHA made every effort to ensure families were given the most up-to-date, consistent, and accurate information available. Families were updated by the family liaison representatives on an hourly basis. This was typically supplemented by two visits per day by the Assistant Secretary, who provided current information and answered questions posed by family members.

The number of family members attending the meetings varied from 20 to 60 individuals depending on the day of the week and time of the briefing. It is highly probable that, because of the fluctuation in attendance at these briefings, all family members may not have received precisely the same information at the same time.

MSHA allowed two family members, who were experienced miners, to travel underground to the rescue site and to the drill site on the surface to facilitate communication of timely and accurate information about the rescue effort to the families.

While MSHA declined to speculate or engage in theoretical debates, full, clear and accurate information was provided as soon as it was determined to be reliable. Many of the inconsistencies and false hopes were the result of comments provided by the operator. For example, the operator publicly promoted the idea that the accident was caused by an earthquake. MSHA's response was that the Agency could neither confirm nor deny the report at that time because bumps or coal outbursts can be caused by an earthquake but the cause of the accident had not yet been determined. Instead, MSHA articulated its focus on the rescue operation and indicated that it would make the appropriate determination at a later and more appropriate time. The operator also stated that retreat mining had nothing to do with the accident. MSHA advised that

retreat mining had occurred; however, we did not know initially if the crew was retreat mining at the time of the accident.

MSHA provided all information as accurately as possible and tried to provide a realistic analysis of the information. As long as there is a possibility that miners may be alive, rescuers must maintain hope. When all hope is lost the rescue operation must be stopped. It would have been a tragedy to stop rescue efforts while there was a possibility that someone could have survived. While MSHA maintained hope for the rescue of the trapped miners throughout its efforts, this was tempered by the difficult reality of the situation; this assessment was also shared with the families in a timely and appropriate manner.

MSHA will continue to provide the most accurate information as quickly as possible to families and before the public or media.

Milestone: Not applicable

Recommendation No. 62 (IR page 110): Any information disseminated which is later determined to be inaccurate should be correctly communicated to the families as soon as possible.

MSHA Response: MSHA disagrees with any suggestion that any inaccurate information was not corrected promptly. In all cases, corrections and updates were provided as quickly as practicable. As stated in response to recommendation item 61, however, MSHA does not publicly speculate or engage in theoretical debates, and in MSHA's opinion, many of the inconsistencies and false hopes were the result of comments provided by the mine operator. For example, the mine operator promoted the idea that the accident was caused by an earthquake. MSHA's response was that the Agency could neither confirm nor deny the report at that time since mountain bumps can be caused by earthquakes. Instead, MSHA articulated that we were focused on the rescue operation and would make the appropriate determination at a later and more appropriate time. As also noted above, MSHA corrected the operator where inaccuracies were identified.

The operator also stated that retreat mining had nothing to do with the accident. MSHA advised the press that retreat mining had occurred; however, we did not know if the crew was retreat mining at the time of the accident.

On one other occasion, a handheld monitor reading indicated a 20.6% oxygen level from #1 borehole because the drill steel, plugged with mud, caused an inaccurate sample reading. This erroneous reading was determined at about 1:45 A.M. in the morning after the families had been briefed the night before at approximately 11 P.M.

MSHA Headquarters personnel were made aware that the correct sample reading was approximately 7.4% oxygen. Because of the lateness of the hour and the fact that family members had already departed for the night, a decision was made to alert the family members the following morning at the 9 A.M. family briefing.

The low oxygen reading from #1 borehole was explained to the families and they were told that it would not support life if miners were in that area. The exact location where the borehole intercepted the mine was posted on a mine map at the family center and was reviewed with the families. Additionally, the unidentified vibrations that were recorded after #3 borehole intersected the mine were explained to the families and their significance was downplayed by stating they could have been caused by a large animal walking on the surface.

The family briefings were a major focus for the Assistant Secretary. Information was always shared with the families first and any inaccuracies were corrected as soon as practicable.

Milestone: Not applicable

Recommendation No. 63 (IR page 111): During a mine emergency involving a non-English speaking family member, MSHA should ensure that information discussed during the family briefings is shared with family members in the most appropriate manner.

Recommendation No. 64 (IR page 111): MSHA should evaluate every operator's ERP to ensure the plans, where necessary, address providing interpreters for non-English speaking miners and their families in the event of a mine emergency. MSHA should require operators to revise the ERPs if needed.

MSHA Response: MSHA will complete the following corrective action by the projected milestone date:

1. CMS&H Administrator will issue a memo to District Managers instructing them to review mine ERPs to assure that provisions are made for interpreters at all mines where non-English speaking families may be involved. Information will be shared with families in a suitable manner.

Milestone: 01/01/2009

Recommendation No. 65: The MSHA person-in-charge of a rescue operation should not brief or interact with family members of trapped or missing miners.

MSHA Response: MSHA disagrees that the MSHA person-in-charge should never brief or interact with family members in all cases. Family liaisons provide a continuous source of information to families and are primarily responsible for this function. However, MSHA retains the option of permitting families to meet with senior MSHA officials as may be appropriate. The Assistant Secretary (who was not the person in charge in this case) or other senior MSHA officials will meet with families when appropriate. MSHA believes that more than any other party with an interest in an ongoing mine rescue/recovery operation, the families have an interest in meeting and interacting with MSHA senior officials as circumstances warrant. The rationale for this recommendation, i.e. developing emotional ties that may cloud the judgment of decision makers, is speculative and is not believed to have occurred in this case.

MSHA Program Policy Letter No. P06-V-11, dated December 22, 2006, sets forth policy and guidance whereby MSHA will establish family liaisons to serve as the primary communicators with families of mine accident victims. The designated family liaisons will make arrangements to meet with family members and remain accessible to them during the emergency. The MSHA policy was followed with 24-hour family liaison presence to assist and attend to the needs of the families. The independent review report references instances where other senior MSHA management officials, in addition to the designated family liaisons, also met with the families and provided informational briefings. These instances did not replace the designated family liaison personnel, but rather enhanced the attention and care given the affected families and provided the most current information available.

The IRT's belief that senior MSHA officials assumed the duties of the family liaison is not accurate when in fact MSHA's senior officials supplemented and enhanced the attention MSHA provided the families. In MSHA's opinion, it is unrealistic that MSHA senior management will never meet, interact, or address the families when they are on site but at it they will address the press on a regular basis. It is fair to presume that concerned family members will want to hear from senior MSHA officials should they be on site.

MSHA's established policy is that family liaisons provide a continuous source of information to families and are primarily responsible for this function. However, MSHA retains the option of permitting families to meet with senior management officials as may be reasonable and appropriate.

Milestone: Not applicable

Topic: Primary Communicator

Recommendation No. 66 (IR page 121): Consistent with the MINER Act, MSHA should be the primary source of all information shared with the media during mine emergencies.

MSHA Response: MSHA will continue to serve the role of the primary communicator. In addition, MSHA will complete the following corrective action by the projected milestone date:

1. Advice will be obtained from SOL regarding MSHA's authority to prohibit mine operators from meeting with or releasing information to the media - particularly at offsite locations. While being mindful of a person's First Amendment rights to speak, MSHA will take steps to address the IRT's recommendation to the extent legally and practically possible. MSHA will provide information to the public and media through an assigned primary communicator(s).

Milestone: 01/01/2009

Recommendation No. 67 (IR page 121): MSHA should ensure that erroneous or unsubstantiated information provided to media and the public is corrected as soon as practical.

MSHA Response: MSHA disagrees with the assertion that information was not corrected at Crandall Canyon. In all cases, corrections and updates were provided as quickly as practicable. However, as stated in item 61, MSHA does not publicly speculate, engage in theoretical debates or address subjects not related to the rescue effort. In MSHA's opinion, many of the inconsistencies and false hopes were the result of comments provided by the mine operator. For example, the mine operator promoted the idea that the accident was caused by an earthquake. MSHA's response was that the Agency could neither confirm nor deny the report at that time since mountain bumps can be caused by earthquakes. Instead, MSHA articulated that we were focused on the rescue operation and would make the appropriate determination at a later and more appropriate time.

The operator also stated that retreat mining had nothing to do with the accident. MSHA advised the press that retreat mining had occurred; however, we did not know if the crew was retreat mining at the time of the accident.

On one other occasion, a handheld monitor reading indicated 20.6% oxygen at #1 borehole because the drill steel, plugged with mud, caused an inaccurate sample reading. This erroneous reading was determined at about 1:45 A.M. in the morning after the families had been briefed the night before at approximately 11 P.M. MSHA Headquarters personnel were made aware that the correct sample reading was approximately 7.4% oxygen. Because of the lateness of the hour and the fact that family members had already departed for the night, a decision was made to alert the family members the following morning at the family briefing at about 9 A.M.

MSHA corrected all appropriate erroneous and unsubstantiated information as quickly as practicable.

Milestone: Not applicable

Recommendation No. 68 (IR page 121): MSHA should establish a policy mandating that a separate individual be assigned to fulfill the roles of person-in-charge, family liaison, and primary communicator during an emergency.

MSHA Response: MSHA agrees that a separate individual be assigned to fulfill the roles of person-in-charge, family liaison, and primary communicator during an emergency. However, it must be recognized that a strict delineation of roles and responsibilities may be impractical and imprudent in some circumstances, especially during the initial stages before additional support personnel arrive.

MSHA will complete the following corrective action by the projected milestone date:

1. CMS&H Administrator will issue a memo to District Managers to clarify that the roles will be primarily assigned to separate persons. However, any of these persons or other senior MSHA officials may meet with the families and press, when appropriate.

Milestone: 11/01/2008

Recommendation No. 69 (IR page 121): In accordance with Secretary's Order No. 17-2006, the Assistant Secretary should immediately establish qualifications and training requirements for MSHA personnel who serve as primary communicators at accident sites.

MSHA Response: MSHA will complete the following corrective action by the projected milestone date:

1. Guidance will be requested from the Office of Public Affairs (OPA) regarding the appropriate qualifications and training requirements for persons who may be assigned this role.

Milestone: 01/01/2009

Topic: Mine Emergency Response Development

Recommendation No. 70 (IR page 122): MSHA should develop a program to train personnel in charge of rescue and recovery operations, which includes the MERD training program. The MERD training should be provided annually, not only for top

managers, but also supervisors, inspectors, appropriate personnel from Technical Support, and all other personnel who may be involved in a mine emergency operation.

MSHA Response: The MERD training will be reevaluated and other training exercises developed and offered periodically in order to include family liaisons, supervisors, and other appropriate MSHA personnel in routine mine emergency operations training.

MSHA will complete the following corrective action by the projected milestone date:

1. Training will be provided through a series of MERD exercises or other training. Family liaison, supervisors, and other appropriate personnel will be included. This will be an ongoing process, the first conducted prior to January 1, 2009.

Milestone: 01/01/2009

Topic: MINER Act (Post-Accident Communications)

Recommendation No. 72 (IR page 128): The Agency should determine if there are any actions that can be taken to expedite the development, manufacture, approval, and installation of wireless systems that would be able to provide communication to trapped or missing miners in the event of any type of mine emergency.

MSHA Response: The Mine Improvement and New Emergency Response (MINER) Act requires that operators have a plan to install wireless communication by June 15, 2009, or if not available, the best option. In the interim and consistent with the MINER Act, MSHA has required the mine operator to install a redundant communication system.

If a truly wireless solution is not available by January 2009, MSHA will work with NIOSH to issue guidance on the next-best alternative. In addition, MSHA will complete the following corrective action by the projected milestone date:

1. MSHA continues to assist manufacturers of developing communications technologies in arranging for field demonstrations and in obtaining MSHA approval. All approval applications are prioritized. MSHA is committed to providing mine operators with guidance concerning wireless communications and electronic tracking systems by January 2009.

Milestone: Ongoing

Recommendation No. 73: MSHA should develop policy that outlines the requirements for an acceptable wireless communication system.

MSHA Response: The Mine Improvement and New Emergency Response (MINER) Act requires that operators submit a plan to install wireless communication and tracking systems. Where such plans set forth the reasons that a wireless system cannot be installed, the plan shall set forth the operator's alternative means of compliance. MSHA will complete the following corrective action by the projected milestone date:

1. MSHA continues to work with NIOSH on the development of performance criteria for acceptable alternatives for wireless communications to comply with the MINER Act. MSHA is committed to providing mine operators with guidance concerning wireless communications and electronic tracking systems by January 2009.

Milestone: 01/01/2009

Recommendation No. 74 (IR page 128): MSHA should evaluate how to maintain security in the event wireless communications are used at a mine involved in future mine emergencies.

MSHA Response: MSHA will complete the following corrective action by the projected milestone date:

1. MSHA Technical Support, along with PEIR will evaluate wireless communication technologies when available and, as necessary, will purchase equipment needed to maintain secure radio communications. Underground systems are designed to provide easy and unlimited access. It may not be practical to provide secure communication underground in all cases.

Milestone: 01/01/2010

Topic: MINER Act (Post-Accident Tracking)

Recommendation No. 75 (IR page 129): The Agency should determine if there are any actions that can be taken to expedite the development, manufacture, approval, and installation of electronic tracking systems that would be able to accurately determine the location of trapped or missing miners in the event of any type of mine emergency.

MSHA Response: MSHA will complete the following corrective action by the projected milestone date:

1. MSHA continues to do all it can do to assist manufacturers of developing electronic tracking technologies in arranging for field demonstrations and in obtaining MSHA approval. All approval applications are prioritized. The MINER Act requires that operators have a plan to install electronic tracking by June 15, 2009. MSHA is committed to providing mine operators with

guidance concerning wireless communications and electronic tracking systems by January 2009.

Milestone: Ongoing

Recommendation No. 76 (IR page 129): MSHA should develop policy that outlines the requirements for an acceptable wireless tracking system.

MSHA Response: MSHA will complete the following corrective action by the projected milestone date:

1. MSHA continues to work with NIOSH on the development of performance criteria for electronic tracking systems to comply with the MINER Act. MSHA is committed to providing mine operators with guidance concerning wireless communications and electronic tracking systems by January 2009.

Milestone: Ongoing

Topic: MINER Act (Post-Accident Breathable Air)

Recommendation No. 77 (IR page 130): The Agency should determine if there are any actions that can be taken to ensure that post-accident breathable air is provided in accordance with the MINER Act as expeditiously as possible.

MSHA Response: As of July 9, 2008, 301 portable refuge units have been manufactured for U.S. coal mines by the 4 primary portable refuge manufacturers, in addition to mine shop built units. Production projections indicate an additional 409 portable refuge units will be manufactured by December 31, 2008, for a total of 710 units in addition to mine shop built units. Current manufacturer production schedules indicate 892 portable units will be manufactured by June 30, 2009 thereby filling all current orders for portable refuge units for U.S. coal mines.

MSHA will complete the following corrective action by the projected milestone date:

1. MSHA has developed a proposed rule (06-16-2008) for refuge alternatives, scheduled four public hearings, and plans to complete the final rule by December, 2008. Technical Support will continue to evaluate rapidly deployed inflatable stoppings for use in emergency barricading. To date, three inflatable stopping manufacturers have developed and demonstrated their systems. Technical Support will monitor refuge manufacturer production schedules quarterly and apprise CMS&H of significant delays in meeting production schedules. MSHA will continue to evaluate all options for assuring the availability of breathable air in a prompt, safe and effective manner.

Milestone: 06/30/2009

Topic: Mine Emergency Evacuation Rule (SCSRs)

Recommendation No. 78 (IR page 132): The Agency should determine if there are any actions that can be taken to ensure that SCSRs are provided in accordance with the rule as expeditiously as possible. This should include re-evaluating the policy of allowing the operator to obtain a purchase order for the purchase of equipment as compliance with this standard.

MSHA Response: MSHA will complete the following corrective action by the projected milestone date:

1. MSHA has contacted all SCSR manufacturers, and all backlogs should be filled by the end of this year. CSE and Ocenco are producing SCSRs at maximum capacity, and Draeger has inventory available. MSHA will remain in contact with these manufacturers.

Milestone: 01/01/2009

Topic: Staffing & Resource Utilization

Recommendation No. 79 (IR page 143): CMS&H's budget should be sufficient to permit the Agency to maintain staffing levels which allow the Agency to consistently perform all required inspections and plan reviews.

MSHA Response: MSHA will complete the following corrective actions by the projected milestone date:

1. As of June 30, 2008, CMS&H had 754 enforcement personnel, of which 591 are authorized representatives and 163 are inspector trainees.

Milestone: Ongoing

2. During the supplemental hiring as a result of the FY2006 Emergency Supplemental Appropriation, CMS&H's has achieved a high of 757 enforcement personnel. This figure represents the highest level of Coal enforcement personnel since 1994. As long as CMS&H continues to be funded for that goal, this is an adequate number of enforcement resources to enforce safety and health standards, conduct inspections and plan reviews, and promote safety and health conditions in our Nation's coal mines.

Milestone: Ongoing

Recommendation No. 80 (IR page 143): CMS&H’s focus on compliance assistance and special emphasis activities should be revisited to determine the effect these activities have on the completion of mandatory inspections and plan reviews. The Administrator should ensure that enforcement-related special emphasis activities do not interfere with the inspectors’ completion of mandatory inspections and plan reviews.

Recommendation No. 81 (IR page 143): MSHA should evaluate whether non-enforcement activities should be conducted by personnel other than CMS&H employees.

MSHA Response: MSHA disagrees that compliance assistance and special emphasis activities may have negatively affected the Agency’s ability to address health and safety concerns at our Nation’s mines. All of these accident prevention activities were focused on improving the health and safety of miners and preventing near-miss accidents, injuries, illnesses and fatalities. Compliance assistance efforts were integrated with enforcement efforts by CMS&H and strengthen the enforcement emphasis. MSHA’s implementation of compliance assistance and special emphasis efforts were not random; rather, these efforts were connected to a mining industry safety or health trend, a recent event, history of noncompliance, or some other concern through headquarters or district analyses. The overall decline in fatality and injury and illness rates compared to the 1990s suggests that MSHA’s integrated program of strong and fair enforcement, special emphasis programs and compliance assistance is producing results.

Moreover, CMS&H has well-known, “institutionalized” programs to specifically address accident and injury prevention and create a greater miner awareness of mining hazards and associated work practices. For example, the “Winter Alert” and the Preventive Roof and Rib Outreach Program (PROP) initiatives are valuable tools to illuminate the increased risks associated with seasonal weather changes. A departure from such long-established programs which benefits the miners is not prudent.

Milestone: Ongoing

CMS&H will work with Educational Field Services and Technical Support to maximize the effectiveness of non-enforcement personnel in conducting non-enforcement activities. MSHA, however, believes it should retain the option to use CMS&H personnel to conduct combined enforcement and non-enforcement activities to improve the health and safety conditions for our Nation's coal miners and to prevent near-miss accidents, injuries, illnesses and fatalities. As it has done for decades, CMS&H will also continue to integrate special emphasis efforts into regular inspection activities that have a negligible effect on the enforcement program.

Milestone: Ongoing

MSHA Response: MSHA will complete the following corrective actions by the projected milestone date:

1. CMS&H will work with Educational Field Services and Technical Support to maximize the effectiveness of non-enforcement personnel in conducting these non-enforcement activities.

Milestone: 11/01/2008