

1/8/2008

Questions for Mike Gauna

The Secretary has assigned this group the task of evaluating MSHA's performance during the period preceding the August 6, 2007 coal bounce at the Crandall Canyon Mine and the subsequent rescue effort. We will also be evaluating issues that were raised during this time period regarding Bob Murray and his interaction with MSHA. This is not an investigation or review of any individual person. It is an administrative review of MSHA's actions as an agency. This evaluation will be presented to the Secretary in the near future, and it is intended that the results of the evaluation will be made public. This interview is being conducted to gather information for this assignment. We also intend to interview a number of other MSHA employees. So that we may obtain unbiased information from all persons to be interviewed, we ask that you not discuss this interview with anyone until all of the interviews have been completed.

[For non-management interviewees: You may have a union representative present if you wish, and may consult with him or her at any time.]

Background/Experience

1. Please state your full name. *Mining Engineer in RCD*
2. What is your current position in Technical Support? How long have you worked in this position? *since April 2010*
3. Briefly describe your work experience before this position. *course, Jim Walter, Island Creek Coal*
4. Can you tell us about your experience with dealing with bumps?
 - a. Previous investigations conducted, publications authored, etc?
 - b. Have you ever presented training on bumps to industry or MSHA personnel? *w/ RCD*
Manalapan, Rivers Edge (2011)
5. What experience have you had in District 9 with evaluating or investigating bumps? *2 entry petitions for Skyline, Dugout (had bump aspects)*
 - i. Have you ever made any recommendations to D9 in regard to preventing or minimizing bumps?
 - ii. If yes, what were they?
6. What is your definition of a bounce/bump? *violent expulsion of pillar inside (rapid)*
 - a. Outburst/burst? *(gas aspect)*
 - b. When would a bump or bounce become immediately reportable to MSHA?

with Island Creek 1987
USAM RI 9325

causes - high stresses, highly confined medium that doesn't yield

Training seminar (after joining MSHA) for MIOSH
run LAMODEL 2P extensively

- 7. Can you tell us about your training in using ARMPS and/or LAMODEL?
- 8. Can you tell us about your experience in using ARMPS and LAMODEL specifically for evaluating bump potential applications?

ARMPS
8:30

giving you relative SF
LAMODEL → gives you insight into stress distribution
Response to the August 6th Event

- 9. When did you first become aware of the August 6 incident?
midday Aug 6th
- 10. Was it immediately clear that it was a bump event and that you were being assigned to respond? If not, explain. 1st thought it was an explosion
- 11. How quickly were you able to respond? left Tuesday morning
- 12. When did you arrive at the mine site? 5:00 PM on Aug 7th
- 13. Whom did you report to when you arrived at the mine? command center

on Aug 7th
(Bill Taylor)
AL OAMS on property

- 14. Was the MSHA organizational structure clear to you? MSHA Blue House
 - a. Who was in charge when you arrived at the mine?
(1) log book
 - b. Did this change when HQ personnel arrived?
(2) several MSHA enforcement personnel
- from Mike's perspective, he was working with Person in Blue House
- 15. What instructions were you given? By whom?
on 7th, go immediately U6 and evaluate (JGZ MC and Gary Jensen)
- 16. Who did you interact with from the company?
Lane Adair
- 17. How did this working arrangement with the company come about?

- 18. Under this arrangement were you able to obtain the necessary technical information that you felt you needed? (maps, geologic information, etc)
- 19. Were you ever consulted on the plans the operator was submitting for the underground rescue operations?
 - a. What was your involvement in the plan approval process?
- 20. On August 7th you went underground with Gary Jensen for an initial assessment of the area. What were your first thoughts of what you observed?

21. According to Joe Zelanko's notes, on Wednesday August 8th, you and Joe reviewed the proposed mining plan for the rescue effort. What did this review consist of?
22. Based on this initial review, did you recommend any changes?
23. How did the decision to use a Lexan shield for the CM operator come about?
24. Was there also any consideration given to providing the shuttle car operators with additional protection? *confirmed they were (on Aug 9th) protected from existing cables, etc*
25. What did you do on August 8th as far as running ARMPS and LAMODEL?
26. What was your goal with these efforts?
27. Were you successful in getting useful output?
28. Who did you discuss this information with? (From MSHA, and the Company both)
29. Did you make any recommendations based on these models?
 - a. To whom?
 - b. Did they consider your recommendations?
30. Did you continue to run additional ARMPS and LAMODEL runs?
31. What input parameters were you changing compared to the initial runs?
32. Did your results alter your thoughts on the rescue effort in any way?
33. Were the decision makers for MSHA available for you to consult with?
 - a. Did they ever ask you for input or about your concerns?
yes, free access to Stebler, Strickler, A. Davis
34. Did you ever feel that the MSHA decision makers were relying on TS to determine if it got too dangerous to continue with the underground operation? *(felt everybody was relying on each other)*
 - a. Did you feel pressure as being responsible for whether the rescue operation should have continued or not?
 - b. Is it normally the function of TS to make these decisions in an operation of this type?
 - c. Would the function of TS normally be as advisors to the persons in command, or to be decision makers?

35. What did you really feel your role in this operation was? Why?
36. With the magnitude of the bounce that occurred and 7% oxygen readings from the # 1 borehole, did you feel there was still a chance of survival of the 6 missing miners?
- When did you decide there was no chance of survival?
 - Was this ever discussed with the decision making personnel from MSHA?
 - What discussions were held about the survival of the missing miners? When?
 - Were any MSHA personnel outside the decision makers ever asked if they thought the missing miners survived the original bump? Why not?
37. Did you go underground?
- If yes, what did you think of UG environment where the material was being loaded?
 - Did you feel the plans were being carried out as approved? *yes, when Mike was there*
 - With what you saw, what did you feel about the chance of the missing miners surviving? *06 7th thru the 14th (except for the 8th)*
38. Were you underground when any bounces occurred? If so, please describe it. *Mike believes he was in No. 4 when a bump occurred in No. 1*
- If not, how were you getting information from the underground operations concerning when bounces occurred?
39. Have you ever been in a mine when a bounce occurred? Describe.
- Have you ever seen a bounce as extensive as the August 6 bounce?
 - Have you ever known of anyone cleaning up material expelled due to a bounce where the entries were almost filled with material? Describe.
 - How could any experience with previous bounces be applicable to this in advancing an entry in this area?
40. What did you think of the barrier and roof moving into the # 1 entry and shearing off the roof bolts?
- Can you describe to us how this occurred?
 - What did you think would be the effects of cutting 10 more feet of the barrier as advancement was made in the entry?
41. Were you ever asked to go underground to evaluate safety concerns of the inspectors?

- a. If so, what did you do?
 - b. What were the results or any recommendations?
42. Were you aware of any concerns of any rescue workers about the safety of continuing with the underground rescue operations?
- a. If so, who had the concerns?
 - b. What were the concerns?
 - c. What was done about them?
43. Were you aware that any company workers asked to be removed from the recovery area? *never was aware of this until the 16th*
- a. If so, did you talk with them or assign anyone to talk to them as to why they elected to be withdrawn from the underground operation?
 - b. If yes, what were their concerns?
 - c. Did you do anything to address their concerns?
 - d. If not, why?

Request for Keith Heasley to Model

44. Was it your decision to contact Keith Heasley about doing some modeling? *see 2's idea*
45. Did you consult with anyone prior to contacting Keith? Who? *asked Mr. Steibler on Aug 11th*
46. When did you first contact him? *(link to e-mail)*
47. What did you do to assist him with the modeling?
48. When did you get feedback from Keith?
49. Describe Keith's results.
50. Did his results alter your thinking about any aspect of the rescue effort?
51. Has Keith or any other expert been contracted as part of the official investigative effort? Please explain.

wanted Keith to use model with paper topography

*until to contacting Keith
Laine Adair gave them detailed briefing*

Keith's feedback was used by experts on Aug 19th

Support Plan

52. According to Joe Zelanko's notes, on August 8th, you and Joe also provided an opinion of the standing support? What did this consist of?

8" x 8" timbers
vs
6" x 9" oak

53. Were the Rocprops considered at this time (instead of posts)? Explain.

54. What experience do you have with Rocprops? *None prior to CC.*

55. When did the Rocprops become part of the support plan? *around x-cut 119*

56. Were these 40 ton Rocprops?

- a. Were they subsequently increased to 50 ton props?
- b. Who recommended this change and why?

(Not aware of 50 ton being used)

57. Did you consult NIOSH (Tom Barczk) about the standing support aspect of the support plan?

- a. If so, what were his recommendations?

based on pressurization aspect

58. Did you solicit any input from local personnel (either MSHA inspectors or company personnel), or did they ever offer input, on the use of Rocprops?

- a. If so, what did this consist of?

59. Did anyone ever inform you that Rocprops had been blown out in bumps at other mines? *(heard this way after the 16th)*

- a. If you had known this, how would it have affected your decision to use them? *would*

60. Were you aware of Rocprops becoming dislodged due to shuttle cars bumping them? Did this concern you in any way?

61. Are you aware of any problems with the Rocprops being installed in a tilted manner?

- a. Did you ever see any that appeared to have been kicked out or moved at the bottom?

- i. Did you feel they were installed incorrectly?

62. How were the wire ropes being secured on the last prop?

- a. Was this an effective method to insure that the ropes would hold the props in place?

- b. Were any other methods of securing the wire rope considered?

- i. If yes, what were the ways?
 - ii. Why were they not attempted?

*crushy clamps
to come-alongs
to tighten*

*↓
talk early on
about trying to
anchor to roof bolt*

63. In your opinion, was the material in the # 1 entry serving as support for the barrier and adjacent pillars?
- a. What was the effect of removing the material?
64. What set pressure was used for the Rocprops—how was this arrived at? *doesn't know*
- a. How was it assured that the correct pressure was applied?
65. Were the Rocprops color-coded based on height? Explain. *yes*
- a. Was there ever a concern about the recommended set height being exceeded? *Not aware of this concern*
66. Was there an attempt to calculate a lateral load capacity of the Rocprops at this set pressure? *on Aug 12th Mike asked about Rocprop for high area*
- a. If so, how was it done? *Not aware of this*
- b. What was the result?
67. Would Rocprops not be more designed for vertical support instead of lateral support?
- a. Why were they considered as support for lateral forces? *because of pressurization aspect*
68. Do you feel the Rocprops were doing anything to actively prevent a bounce?
- a. If yes, what? *to contain - placed*
- b. If no, what was their purpose? *away from rib so*
- c. If the props were just being used to protect people from material from the ribs, do you think the props would have held the material expelled in the # 4 entry from the bounce on August 7? *energy could be dissipated*
69. Did you or Joe Zelanko discuss with Peter Saint the possible use of a bracket for the Rocprops designed to better resist lateral loading? (pictures) *did not hear about this until Sept.*
- a. Did you (or anyone else) investigate this bracket further?
- b. If not, why not? (What factors did you consider in this decision?)
70. Did you or anyone have contact with the San Juan mine where the bracket props were developed and used?
- a. Did they offer any assistance?
71. What was used in conjunction with the Rocprops (top and bottom of jacks)?
- a. Were there concerns about the wood yielding after the initial set?

wood block on roof

bearing plate - at floor

72. Can you tell us what you know of any other support methods that were considered? (tunnel liners, arches, etc)

73. Was the support plan re-evaluated at any point in time as the rescue/recovery effort continued?

NO — only re-evaluation was about which entry

Review of Agapito reports

74. When did you first become aware of the Agapito reports?

on Aug 7th — (W drive)

75. What reports were these? (Dates)

(July 20, 2006 April 18, 2007) (not aware of e-mail report)

76. Upon learning of the reports, when did you request and receive them?

77. What was your initial opinion? Mike questioned calibration of July 2006 — ad figure 20

78. What did you do to analyze these reports? (Did you attempt to run ARMPS and/or LAMODEL?)

cross-section of stress distribution

79. What did your analysis of the Agapito evaluation reveal?

80. What do you think of Agapito's use of the following that they used in their original analysis?

a. Coal strength

b. Elastic modulus of coal

NOT a very sensitive parameter

c. Mine geometry

i. How they handled the bleeder pillar in their evaluation?

d. LAMODEL yielding zones

i. In the Jul 20th report do you feel that this cross section is realistic — the fact that it shows such high stress levels dissipating in such a short distance and not loading up the adjacent pillars?

e. Stability factor calibrated for mine appears to be where the mine had trouble.

81. Are you aware of the NIOSH work in 2002 to update the initial ARMPS software with more case studies of mines with deeper overburden?

a. Specifically, have you reviewed the NIOSH paper entitled "Deep Cover Pillar Extraction In The US Coalfields"?

b. One aspect of this paper emphasizes the importance of barrier pillars to prevent bumps. The paper concludes that for the NIOSH

database of case histories, when a Barrier Pillar Stability Factor of 1.9 was achieved, no bumps occurred. Are you aware that this information is discussed and available in the ARMPS help files?

- c. In light of this, were you surprised that the BPSF was not analyzed for Crandall Canyon as part of the District 9 ARMPS evaluation?

82. When did you first become aware of the March 11, 2007 bump in the North Barrier? *after the Aug 7th - during the rescue effort*

83. Considering the circumstances of the March 11th bump (retreat mining under an area of 2000 ft of cover) and the fact that the upcoming mining in the South Barrier would essentially duplicate this scenario, should the plan to mine the South Barrier been approved?

84. Did anybody discuss the March bump with you while you were at Crandall Canyon?

- a. If so, please explain.

85. At the time you first heard of this bump did you consider it reportable under Part 50? If not, why not?

86. When did you first become aware of the April 18, 2007 Agapito report discussing the March 2007 bump?

- a. Are you aware of the statement in this Agapito report that discusses the March 2007 bump in the North Barrier retreat section, (highlighted here) describing it like this: "A large bump occurred at this point resulting in heavy damage to the entries located between XCs 133 and 139? The remaining north panel was abandoned in favor of mining the south barrier."
- b. Based on this description of the March bump, do you believe that retreat mining in the North Barrier was stopped simply because of bleeder entry stability?
- c. In light of this description, should an ARMPS or LAMODEL analysis be re-ran at this time using the North Barrier as historical mine data?

87. Were you aware of the pictures taken by mine management during Agapito's March 16, 2007 visit to the bump area? (*refer to photos*)

88. If you had investigated the March bump and saw damage such as is shown in these photos, would you have considered this as a failure in the ARMPS "groundproofing" scheme of things? (Essentially would you have considered this a new "failure" point in the ARMPS database – at the

- ARMPS SF of .53 – thus calling into question the validity of the Agapito claim that the 1st North historical analysis was valid?)
- a. Would you have then asked the mine for additional justification to retreat mine in the South?
89. The roof control plan amendment submitted on May 16, 2007, and approved June 15, 2007, for the South Barrier states: “*Consultant reports indicate the development will avoid the majority of the side abutment stress transferred from the adjacent longwall panels. These assessments have been validated by conditions experienced in the mine.*” This amendment was submitted after the bounce in the North Barrier caused mining to cease there.
- a. In your opinion, how did the operator justify this statement in light of the bounce in the North Barrier?
 - b. Based on available information, should the plan to retreat in the South Barrier have been approved?
90. The roof control plan addendum approved March 8, 2007 specified the same pillar size as the Nov. 21, 2006 plan addendum (80’ by 90’). After the March 10, 2007 bump in the North barrier, Agapito recommended by letter dated April 18, 2007 that the crosscut centers be increased to 129’ in the south barrier.
- a. Also Agapito had stated in their July 20, 2006 report that increasing crosscut spacing is not expected to significantly improve ground conditions, then in April 18, 2007 after evaluating the bump in the North barrier, they stated that the additional 37 foot pillar length would increase the coal strength of the pillars’ confined cores which helps to isolate bumps to the face and reduce the risk of larger bumps overrunning crews in outby locations.
 - b. What is your opinion of this apparent contradiction and oversight?
91. When comparing this roof control plan amendment with this ventilation plan amendment, they appear to conflict in allowing the operator to extract the three pillars between the # 1 and # 2 entries in by cross-cut 139. What is your opinion of this?
92. Also in regard to leaving the additional pillars from x-cut 139 to 142, this would appear to be in conflict with the April 18, 2007 Agapito report which cautions: “*Skipping pillars should be avoided in the south barrier, particularly under the deepest cover.*” Would this concern you?
- a. Should an ARMPS or LAMODEL evaluation have been conducted taking the skipped pillars into account? In your opinion, what would it have shown?

93. What was your first thought when you saw the map showing the barrier pillars being mined at Crandall Canyon?

a. Are you familiar with any other mines that have or are mining barrier pillars in similar depths of cover? *NO - in industry NO*

b. What is your opinion of it?

doable under shallow conditions (under 750'-800')
RCD - NO

94. What is your interpretation of mining bottom coal?

95. Were you aware that bottom coal was being mined at Crandall Canyon?

a. Would the increased mining height have affected the stability of the barrier and pillars?

96. Did any of the ARMPS analyses conducted by the District or Agapito consider a mined height greater than 8 feet?

97. Did any of Agapito's LAMODEL analyses consider a mined height greater than 8 feet?

98. Have you obtained other Agapito reports as part of the investigation?

a. What have these reports revealed?

Aberdeen Mine

99. What type of work has TS done at the Aberdeen mine?

100. Did you or other Roof Control Division personnel visit the Aberdeen mine with Billy Owens on May 23, 2007?

a. Why?

b. What were the results of this visit?

Use of Seismic Data

101. When did you first contact the University of Utah concerning the seismic data? *Joe Z & Tom Morley did*

102. Did you consider contacting them at any time prior to this?

103. Was using the seismic data considered as a way to analyze the frequency and severity of bumps during the rescue operation? (As a predictive tool)

*mined at
affects SF
substantially*

104. What was the thought process concerning the seismic data?
105. Why contact them on August 29th?
106. Did you see or analyze seismic logs relating to bumping underground during the rescue operation? (*Show bump activity log*) — NO — *engineer from Utah American showed me a seismic log*
- a. Were you aware of the bounce that occurred on the early morning hours of August 7?
 - b. If so, what was your opinion of this?
 - c. Did removing the material in the # 4 entry have any effect on causing this bounce?
 - d. Would removing the material in the # 1 entry not cause the same effect?
107. Did you analyze frequency of bumps or severity of bumps from reports of the underground crews and the logs?
- a. If not, was anyone assigned anyone to evaluate the frequency and severity of bumps that were occurring?
 - b. Did this analysis give you any reservations about continuing with the rescue operation because of the frequency or severity of the bumps?
 - c. Did you or anyone else suggest stopping the rescue operation because of the recurring bumps? If so, to whom?
 - d. Did anyone ever ask your opinion about whether or not the UG rescue operation should continue? If so, who?

Convergence Stations

108. When and why did you install the convergence stations?
109. How did you decide on the locations?
110. How often did you take readings?
111. What did the readings reveal?
- a. What good did the convergence stations do?
112. Was there any correlation between the bumps reported and convergence?

113. Were the readings routinely passed on to the command center? The company?

BLM Contacts and Reports

114. When did you first contact BLM?

morning of Aug 15th
in Salt Lake City

115. Did you meet someone in ~~Price~~? When?

Kohler - in Salt Lake City

116. How did this come about?

117. What information did you obtain? (Reports, geologic logs) (Did they get more than the four reports that we have? Link to BLM reports 1/24/05; 3/05/07; 7/12/07; 8/13/07)

got these reports only
as part of accident
investigation

118. Did you follow-up with a meeting in Salt Lake City?

119. What did you learn from this?

Ground Control Experts

120. Who suggested that the panel of ground control experts be convened?

121. When was this?

122. Was consulting outside experts considered earlier than this date?

a. If so, when?

b. Why were they not consulted before the August 16 accident?

123. Who had input into the selection of the experts? (Was the company involved in the selection process?)

124. When did the experts get on site?

125. Did the expert committee travel underground? (Why not?)

126. Who briefed them?

127. What did the panel conclude? Was a formal statement issued?

Mike read a statement that the
panel issued

128. How well do you know Billy Owens?
- Do you know what his background concerning bounces?
129. What do you think about Billy Owens experience in ground control?
130. Why was Billy not brought to the mine site during the rescue?
- Did you ever consult with Billy during the rescue operation about what his opinions would be?
 - Why or why not? If yes, what did he recommend?
131. In your opinion, has D9 ever made a concerted effort to prevent or reduce bounces?
- What are they?
 - Have they ever contacted TS for help concerning preventing or reducing bounces?
 - What do you feel about the use of shielding and body armor for protection from bounces as opposed to preventing or reducing bounces?

Investigation Team's UG Visit to Crandall Canyon

132. Who made the decision for the Accident Investigation Team to revisit the scene of the August 16th bump? *(- Sept 10, 12th)*
133. When did you do this?
134. How far inby were you able to travel? *went to accident site inby X-126*
135. Did representatives of the Company or the miners accompany you?
136. How was it determined that it was safe for the team to do this?

Additional Questions

*still getting Richter Readings of 1.3, 1.6, 1.2
9/15, 9/18, 9/20*

137. The Roof Control Division tracking sheets show that Bill Knepp requested Technical Support assistance for the Aberdeen Mine in May 2007. ([*link to tracking sheet*](#)) Were you aware of this request when it was first made?
138. Do you have any knowledge of a request for assistance for the Crandall Canyon Mine being made at the same time as this request?
139. Is there anything else you would like to tell us that we may not have asked you?

This is all the questions we have for you at this time. We may have more questions in the future. If so, we will contact you and set up a follow up interview. If at a later time you think of something additional you would like to tell us or think we should be aware of, please let us know.

Would you agree to not discuss this interview with anyone else in order that we may obtain unbiased information from future interviewees?

Thank you.

1/8/2008

Mike Sauna

Aug 7th evaluation,
started at x-cut 109
began to see evidence of high stress at 117

did NOT go into 119 in NO 4 because
of ground working

— NO. 2 almost up to 120
— NO 1 up to 120

photo log

8/07

— after initial OG observations, they met
with Lane Adair, got overview,
topo map, etc, told they thought
crew was roughly at x-cut 130

No. 1 entry was already decided upon
by company

on Aug 8th JCZ & MG started analysis

1/8/2000
MO page 2

LAMODEL → when you ~~started~~ dropped
input to default values you
got total failure (everything
went to yield)

contacted Billy - got Agapito reports
off of W duve

LAMODEL & ARMP5 showed entry 3 or 4
was best - did not match
OG conditions

Very long, large group meeting
to establish protocol to advance
in No. 1 entry

ON Aug 11th (afternoon) - believe this
was a change to prior plan

Open-ended question to Tom Baregok
Tom responded with Rec prop

On Aug. 11th, went back out to mine because of bump, went UG around midnight Aug 12th

in log book at 21:06

RCD photos from 8/12
slides No. 4 & No. 5

→ maybe had lost 3 or 4 feet off of pillar — only props (all out)

had very high mercury ht — around 11'

examples of

— joints in 115 to 117 — Mike made recommendations for additional support

See 2 — large intersection seen around 120

Mike initially believed $4\frac{1}{2}$ minute duration
of seismic activity would give the man a chance. (This $4\frac{1}{2}$
minute time frame later found to be incorrect)

original topo map showed highest
cover at 127 x-cut

Mike noticed this on Aug 9th (topo question)
wasn't resolved until morning of Aug 16th

2nd big Murray/Stickler meeting
on Aug 14th

lateral shift of barrier
entry x-123 to 126

on Aug 10th Mike re-evaluated
to confirm if No. 1 was
correct entry (he went into
No. 4)

saw signs of bump potential
went to 120 1/2

UG Aug 12th midnight - rebolting
was necessary - longer bolts
7' bolts

slides CC Roof Cont'd 8/11/07
PHOTOS

West Main pillar stress

~~was~~ degradation outby seal area
in Main West

stresses were progressing outby
Gary Peacock raised this issue

- felt bump in No. 4 around 120-121
would have taken out Recprops

- But Mike was evaluating potential
in No. 1 (example of Aug 12
evaluation)

Laine Adair was providing most of
information on Recprop usage
at Aberdeen

Utah American people were looking
at University of Utah website

Mike doesn't know of any effort
to analyze frequency or
magnitude of bump

Laine mentioned in briefing about
effect of panel 12 & 13
on Main West

ARRRS ← Aug 9th & 13th

Aug 13th - 2nd briefing for Laine Adair
substantially the same info -
provided for Keith

South Barrier - significantly more
stable, substantial barrier
behind you

Discussion on Aug 10th around 11:00 AM
with dayshift crew - (prior to trip)
- many bottom coal aspect
- slabby laminae aspect

Mike returned to CC on Aug 22nd

excursion in No. 4 entry

Mike -	121½
Bodee -	
Peter -	125 to 126

Statement about normal photons on 22nd

X-cut 99 — span is affecting loady.
X-cut 83

also

9/10 — are ^{mis} labeled 8/10

9/12 mis labeled 8/12

1/8/08

NS

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3. Briefly describe your work experience before this position.
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 - a. Previous investigations conducted, publications authored, etc?
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7. Can you tell us about your training in using ARMPS and/or LAMODEL?
NIOSH

8. Can you tell us about your experience in using ARMPS and LAMODEL specifically for evaluating bump potential applications?

HAVE USED LAMODEL 2D

Very little work with LAMODEL 3D

Response to the August 6th Event

9. When did you first become aware of the August 6 incident?

8/6/07 MID-DAY - INITIALLY THOUGHT IT WAS AN EXPLOSION SINCE VENT. PEOPLE WERE DISPATCHED

10. Was it immediately clear that it was a bump event and that you were being assigned to respond? If not, explain.

11. How quickly were you able to respond?

Car flight out of Pitt on 8/7

12. When did you arrive at the mine site?

afternoon on 8/7

13. Whom did you report to when you arrived at the mine?

Commercial Center - Command & Foreman (Blue Hoop)

14. Was the MSHA organizational structure clear to you?

- a. Who was in charge when you arrived at the mine? *AL DAVIS*
- b. Did this change when HQ personnel arrived?

15. What instructions were you given? By whom?

Told to go underground & assess conditions, Mike, Zeno, Gary Jensen

16. Who did you interact with from the company?

Sam Adams - gave overview on evening of 8/7 after coming outside

17. How did this working arrangement with the company come about?

18. Under this arrangement were you able to obtain the necessary technical information that you felt you needed? (maps, geologic information, etc)

19. Were you ever consulted on the plans the operator was submitting for the underground rescue operations?

- a. What was your involvement in the plan approval process?

20. On August 7th you went underground with Gary Jensen for an initial assessment of the area. What were your first thoughts of what you observed?

Walked from X-cut 109 toward section looking for high stress - appeared most stress in nos. 3&4 - more than 1 and 2

21. According to Joe Zelanko's notes, on Wednesday August 8th, you and Joe reviewed the proposed mining plan for the rescue effort. What did this review consist of? - *Did LAMODEL & ARMPS to see if no. 1 entry was the best place to proceed*
22. Based on this initial review, did you recommend any changes?
23. How did the decision to use a Lexan shield for the CM operator come about?
24. Was there also any consideration given to providing the shuttle car operators with additional protection?
25. What did you do on August 8th as far as running ARMPS and LAMODEL?
26. What was your goal with these efforts?
27. Were you successful in getting useful output?
28. Who did you discuss this information with? (From MSHA, and the Company both)
29. Did you make any recommendations based on these models?
- To whom?
 - Did they consider your recommendations?
30. Did you continue to run additional ARMPS and LAMODEL runs?
31. What input parameters were you changing compared to the initial runs?
32. Did your results alter your thoughts on the rescue effort in any way?
33. Were the decision makers for MSHA available for you to consult with?
- Did they ever ask you for input or about your concerns?
34. Did you ever feel that the MSHA decision makers were relying on TS to determine if it got too dangerous to continue with the underground operation?
- Did you feel pressure as being responsible for whether the rescue operation should have continued or not?
 - Is it normally the function of TS to make these decisions in an operation of this type?
 - Would the function of TS normally be as advisors to the persons in command, or to be decision makers?

35. What did you really feel your role in this operation was? Why?
36. With the magnitude of the bounce that occurred and 7% oxygen readings from the # 1 borehole, did you feel there was still a chance of survival of the 6 missing miners?
- When did you decide there was no chance of survival?
 - Was this ever discussed with the decision making personnel from MSHA?
 - What discussions were held about the survival of the missing miners? When?
 - Were any MSHA personnel outside the decision makers ever asked if they thought the missing miners survived the original bump? Why not?
37. Did you go underground?
- If yes, what did you think of UG environment where the material was being loaded?
 - Did you feel the plans were being carried out as approved?
 - With what you saw, what did you feel about the chance of the missing miners surviving?
38. Were you underground when any bounces occurred? If so, please describe it.
- If not, how were you getting information from the underground operations concerning when bounces occurred?
39. Have you ever been in a mine when a bounce occurred? Describe.
- Have you ever seen a bounce as extensive as the August 6 bounce?
 - Have you ever known of anyone cleaning up material expelled due to a bounce where the entries were almost filled with material? Describe.
 - How could any experience with previous bounces be applicable to this in advancing an entry in this area?
40. What did you think of the barrier and roof moving into the # 1 entry and shearing off the roof bolts?
- Can you describe to us how this occurred?
 - What did you think would be the effects of cutting 10 more feet of the barrier as advancement was made in the entry?
41. Were you ever asked to go underground to evaluate safety concerns of the inspectors?

- a. If so, what did you do?
 - b. What were the results or any recommendations?
42. Were you aware of any concerns of any rescue workers about the safety of continuing with the underground rescue operations?
- a. Is so, who had the concerns?
 - b. What were the concerns?
 - c. What was done about them?
43. Were you aware that any company workers asked to be removed from the recovery area?
- a. If so, did you talk with them or assign anyone to talk to them as to why they elected to be withdrawn from the underground operation?
 - b. If yes, what were their concerns?
 - c. Did you do anything to address their concerns?
 - d. If not, why?

Request for Keith Heasley to Model

44. Was it your decision to contact Keith Heasley about doing some modeling?
45. Did you consult with anyone prior to contacting Keith? Who?
Yes, asked Mr. Sticker if it would be appropriate to
46. When did you first contact him? (link to e-mail) *bring him on site - 06*
47. What did you do to assist him with the modeling?
48. When did you get feedback from Keith?
49. Describe Keith's results.
50. Did his results alter your thinking about any aspect of the rescue effort?
51. Has Keith or any other expert been contracted as part of the official investigative effort? Please explain.

Support Plan

52. According to Joe Zelanko's notes, on August 8th, you and Joe also provided an opinion of the standing support? What did this consist of?

53. Were the Rocprops considered at this time (instead of posts)? Explain.

54. What experience do you have with Rocprops?

NO

55. When did the Rocprops become part of the support plan?

56. Were these 40 ton Rocprops? *- photo attached showed 40 ton*

a. Were they subsequently increased to 50 ton props?

b. Who recommended this change and why?

57. Did you consult NIOSH (Tom Barczk) about the standing support aspect of the support plan?

a. If so, what were his recommendations?

Tom recommended Rocprop because you could pressurize

58. Did you solicit any input from local personnel (either MSHA inspectors or company personnel), or did they ever offer input, on the use of Rocprops?

a. If so, what did this consist of? *Don't know*

59. Did anyone ever inform you that Rocprops had been blown out in bumps at other mines? *No. not until after 8/10*

a. If you had known this, how would it have affected your decision to use them?

60. Were you aware of Rocprops becoming dislodged due to shuttle cars bumping them? Did this concern you in any way? *NO*

61. Are you aware of any problems with the Rocprops being installed in a tilted manner?

a. Did you ever see any that appeared to have been kicked out or moved at the bottom?

i. Did you feel they were installed incorrectly?

Heard that they had been set in tilted manner.

62. How were the wire ropes being secured on the last prop?

a. Was this an effective method to insure that the ropes would hold the props in place?

b. Were any other methods of securing the wire rope considered?

i. If yes, what were the ways?

ii. Why were they not attempted?

63. In your opinion, was the material in the # 1 entry serving as support for the barrier and adjacent pillars?
- What was the effect of removing the material?
64. What set pressure was used for the Rocprops—how was this arrived at?
- How was it assured that the correct pressure was applied?
65. Were the Rocprops color-coded based on height? Explain.
- Was there ever a concern about the recommended set height being exceeded?
66. Was there an attempt to calculate a lateral load capacity of the Rocprops at this set pressure?
- If so, how was it done?
 - What was the result?
67. Would Rocprops not be more designed for vertical support instead of lateral support?
- Why were they considered as support for lateral forces?
68. Do you feel the Rocprops were doing anything to actively prevent a bounce?
- If yes, what?
 - If no, what was their purpose?
 - If the props were just being used to protect people from material from the ribs, do you think the props would have held the material expelled in the # 4 entry from the bounce on August 7?
69. Did you or Joe Zelanko discuss with Peter Saint the possible use of a bracket for the Rocprops designed to better resist lateral loading? (pictures)
- Did you (or anyone else) investigate this bracket further?
 - If not, why not? (What factors did you consider in this decision?)
70. Did you or anyone have contact with the San Juan mine where the bracket props were developed and used?
- Did they offer any assistance? NO
71. What was used in conjunction with the Rocprops (top and bottom of jacks)?
- Were there concerns about the wood yielding after the initial set?

don't know

*Didn't know as
until Sept.*

72. Can you tell us what you know of any other support methods that were considered? (tunnel liners, arches, etc)

73. Was the support plan re-evaluated at any point in time as the rescue/recovery effort continued?

Yurana had 2 reports 7/20/08

4/18/07 - Agapito from B.O.

Review of Agapito reports

74. When did you first become aware of the Agapito reports?

Billy Owens provided reports on 8/8

75. What reports were these? (Dates)

76. Upon learning of the reports, when did you request and receive them?

77. What was your initial opinion?

Did not have e-mail analysis until later.

78. What did you do to analyze these reports? (Did you attempt to run ARMPS and/or LAMODEL?)

79. What did your analysis of the Agapito evaluation reveal?

80. What do you think of Agapito's use of the following that they used in their original analysis?

- a. Coal strength
- b. Elastic modulus of coal
- c. Mine geometry
 - i. How they handled the bleeder pillar in their evaluation?
- d. LAMODEL yielding zones
 - i. In the Jul 20th report do you feel that this cross section is realistic – the fact that it shows such high stress levels dissipating in such a short distance and not loading up the adjacent pillars?
- e. Stability factor calibrated for mine appears to be where the mine had trouble.

81. Are you aware of the NIOSH work in 2002 to update the initial ARMPS software with more case studies of mines with deeper overburden?

- a. Specifically, have you reviewed the NIOSH paper entitled "Deep Cover Pillar Extraction In The US Coalfields"?
- b. One aspect of this paper emphasizes the importance of barrier pillars to prevent bumps. The paper concludes that for the NIOSH

database of case histories, when a Barrier Pillar Stability Factor of 1.9 was achieved, no bumps occurred. Are you aware that this information is discussed and available in the ARMPS help files?

- c. In light of this, were you surprised that the BPSF was not analyzed for Crandall Canyon as part of the District 9 ARMPS evaluation?

82. When did you first become aware of the March 11, 2007 bump in the North Barrier? *from Luis Adair - overview of mine history*

83. Considering the circumstances of the March 11th bump (retreat mining under an area of 2000 ft of cover) and the fact that the upcoming mining in the South Barrier would essentially duplicate this scenario, should the plan to mine the South Barrier been approved?

84. Did anybody discuss the March bump with you while you were at Crandall Canyon?

- a. If so, please explain.

85. At the time you first heard of this bump did you consider it reportable under Part 50? If not, why not?

86. When did you first become aware of the April 18, 2007 Agapito report discussing the March 2007 bump?

- a. Are you aware of the statement in this Agapito report that discusses the March 2007 bump in the North Barrier retreat section, (highlighted here) describing it like this: "A large bump occurred at this point resulting in heavy damage to the entries located between XCs 133 and 139? The remaining north panel was abandoned in favor of mining the south barrier."
- b. Based on this description of the March bump, do you believe that retreat mining in the North Barrier was stopped simply because of bleeder entry stability?
- c. In light of this description, should an ARMPS or LAMODEL analysis be re-ran at this time using the North Barrier as historical mine data?

87. Were you aware of the pictures taken by mine management during Agapito's March 16, 2007 visit to the bump area? (refer to photos) *NOT UNTIL LATER*

88. If you had investigated the March bump and saw damage such as is shown in these photos, would you have considered this as a failure in the ARMPS "groundproofing" scheme of things? (Essentially would you have considered this a new "failure" point in the ARMPS database—at the

ARMPS SF of .53 - thus calling into question the validity of the Agapito claim that the 1st North historical analysis was valid?)

- a. Would you have then asked the mine for additional justification to retreat mine in the South?

89. The roof control plan amendment submitted on May 16, 2007, and approved June 15, 2007, for the South Barrier states: "*Consultant reports indicate the development will avoid the majority of the side abutment stress transferred from the adjacent longwall panels. These assessments have been validated by conditions experienced in the mine.*" This amendment was submitted after the bounce in the North Barrier caused mining to cease there.

- a. In your opinion, how did the operator justify this statement in light of the bounce in the North Barrier?
- b. Based on available information, should the plan to retreat in the South Barrier have been approved?

90. The roof control plan addendum approved March 8, 2007 specified the same pillar size as the Nov. 21, 2006 plan addendum (80' by 90'). After the March 10, 2007 bump in the North barrier, Agapito recommended by letter dated April 18, 2007 that the crosscut centers be increased to 129' in the south barrier.

- a. Also Agapito had stated in their July 20, 2006 report that increasing crosscut spacing is not expected to significantly improve ground conditions, then in April 18, 2007 after evaluating the bump in the North barrier, they stated that the additional 37 foot pillar length would increase the coal strength of the pillars' confined cores which helps to isolate bumps to the face and reduce the risk of larger bumps overrunning crews in outby locations.
- b. What is your opinion of this apparent contradiction and oversight?

91. When comparing this roof control plan amendment with this ventilation plan amendment, they appear to conflict in allowing the operator to extract the three pillars between the # 1 and # 2 entries in by cross-cut 139. What is your opinion of this?

92. Also in regard to leaving the additional pillars from x-cut 139 to 142, this would appear to be in conflict with the April 18, 2007 Agapito report which cautions: "Skipping pillars should be avoided in the south barrier, particularly under the deepest cover." Would this concern you?

- a. Should an ARMPS or LAMODEL evaluation have been conducted taking the skipped pillars into account? In your opinion, what would it have shown?

93. What was your first thought when you saw the map showing the barrier pillars being mined at Crandall Canyon? *Pretty aggressive plan.*
- a. Are you familiar with any other mines that have or are mining barrier pillars in similar depths of cover? *NO*
- b. What is your opinion of it?
Could be done in shallower cover 700' - 800'
94. What is your interpretation of mining bottom coal?
95. Were you aware that bottom coal was being mined at Crandall Canyon?
- a. Would the increased mining height have affected the stability of the barrier and pillars? *depend on location*
- in pillar split shouldn't affect much
96. Did any of the ARMPS analyses conducted by the District or Agapito consider a mined height greater than 8 feet?
97. Did any of Agapito's LAMODEL analyses consider a mined height greater than 8 feet?

98. Have you obtained other Agapito reports as part of the investigation?

- a. What have these reports revealed?

Aberdeen Mine

99. What type of work has TS done at the Aberdeen mine?

100. Did you or other Roof Control Division personnel visit the Aberdeen mine with Billy Owens on May 23, 2007?

- a. Why?
- b. What were the results of this visit?

Use of Seismic Data

101. When did you first contact the University of Utah concerning the seismic data? *Joe Zelambka*

102. Did you consider contacting them at any time prior to this?

103. Was using the seismic data considered as a way to analyze the frequency and severity of bumps during the rescue operation? (As a predictive tool)

104. What was the thought process concerning the seismic data?
105. Why contact them on August 29th? *Don't know*
106. Did you see or analyze seismic logs relating to bumping *NO*
underground during the rescue operation? (*Show bump activity log*)
- Were you aware of the bounce that occurred on the early morning hours of August 7?
 - If so, what was your opinion of this?
 - Did removing the material in the # 4 entry have any effect on causing this bounce?
 - Would removing the material in the # 1 entry not cause the same effect?
107. Did you analyze frequency of bumps or severity of bumps from reports of the underground crews and the logs?
- If not, was anyone assigned anyone to evaluate the frequency and severity of bumps that were occurring?
 - Did this analysis give you any reservations about continuing with the rescue operation because of the frequency or severity of the bumps?
 - Did you or anyone else suggest stopping the rescue operation because of the recurring bumps? If so, to whom?
 - Did anyone ever ask your opinion about whether or not the UG rescue operation should continue? If so, who?

Convergence Stations

108. When and why did you install the convergence stations? *NO*
109. How did you decide on the locations? *Cephalopod installed*
110. How often did you take readings?
111. What did the readings reveal?
- What good did the convergence stations do?
112. Was there any correlation between the bumps reported and convergence?

113. Were the readings routinely passed on to the command center? The company?

BLM Contacts and Reports

114. When did you first contact BLM?

115. Did you meet someone in Price? When?

116. How did this come about?

117. What information did you obtain? (Reports, geologic logs) (Did they get more than the four reports that we have? Link to BLM reports 1/24/05; 3/05/07; 7/12/07; 8/13/07)

118. Did you follow-up with a meeting in Salt Lake City?

119. What did you learn from this?

Ground Control Experts

120. Who suggested that the panel of ground control experts be convened?

121. When was this?

122. Was consulting outside experts considered earlier than this date?

a. If so, when?

b. Why were they not consulted before the August 16 accident?

123. Who had input into the selection of the experts? (Was the company involved in the selection process?)

124. When did the experts get on site?

125. Did the expert committee travel underground? (Why not?)

126. Who briefed them?

127. What did the panel conclude? Was a formal statement issued?

found out about BLM reports during accident investigation - interviewed Steve Faulk

128. How well do you know Billy Owens?
- Do you know what his background concerning bounces?
129. What do you think about Billy Owens experience in ground control?
130. Why was Billy not brought to the mine site during the rescue?
- Did you ever consult with Billy during the rescue operation about what his opinions would be?
 - Why or why not? If yes, what did he recommend?
131. In your opinion, has D9 ever made a concerted effort to prevent or reduce bounces?
- What are they?
 - Have they ever contacted TS for help concerning preventing or reducing bounces?
 - What do you feel about the use of shielding and body armor for protection from bounces as opposed to preventing or reducing bounces? *good policy - needs to work w/ proper mine design*
- West Elk (special projects)*

Investigation Team's UG Visit to Crandall Canyon

132. Who made the decision for the Accident Investigation Team to revisit the scene of the August 16th bump? *Group decision as a team*
133. When did you do this? *Sept. 10*
Entire accident team in two (waves) groups
134. How far inby were you able to travel? *to the accident site only 120*
135. Did representatives of the Company or the miners accompany you? *NO*
136. How was it determined that it was safe for the team to do this?
checked convergence - no changes

Additional Questions

137. The Roof Control Division tracking sheets show that Bill Knepp requested Technical Support assistance for the Aberdeen Mine in May 2007. ([link to tracking sheet](#)) Were you aware of this request when it was first made? NO

138. Do you have any knowledge of a request for assistance for the Crandall Canyon Mine being made at the same time as this request? NO

139. Is there anything else you would like to tell us that we may not have asked you?

This is all the questions we have for you at this time. We may have more questions in the future. If so, we will contact you and set up a follow up interview. If at a later time you think of something additional you would like to tell us or think we should be aware of, please let us know.

Would you agree to not discuss this interview with anyone else in order that we may obtain unbiased information from future interviewees?

Thank you.

TRI-ACELPHIA

MIKE GAUNA

1/8/08

4/2000 - Tech Support (MSHA)

US B.O.M. RI 93 BUMP PREVENTION

- RIVER'S EDGE MINE IN D-4 (BUMP INVESTIGATION)
REPORT RELEASED IN JAN. 2007
- DON'T THINK EITHER SYSTEM (ARMP - LAMODEL)
ADEQUATELY PREDICTS BUMPS / BOUNCES
- Stresses first appeared at x-cut 115, high of 117
photo log CC 807
- Gary Jensen gave them roof support debriefing
while underground
- Told by Laine Addair that they believed the
crew was at x-cut 138
- Told by Brad Allen that old main west
was virtually gone
- Calculations on 8/8 showed everything was in
"yield" - then got Aggipille reports from
Billy Owens
- calculations showed that #3 + #4 were
best which did not match what they saw
underground
- Meeting w/ Murren, Stecker, MSHA personnel on
8/11 afternoon to establish protocol for rescue
- called BARZACK of NIOSH about roc props

MICHAEL GAJNIA

1/8/08

- * - 103 K order modified on 8/7 at 5:50pm to clear up no. 1 entry (prior to Guava & Zedenko returning from unids.)
 - Meeting on 8/11 3 reps on props limit people
 - Leave on afternoon of 8/11 7:15pm - right side of mine, only the props - went back to mine
 - didn't know that the top-lime were shifted until 8/10 - first concerned about wrong location on 8/9
- * - Never saw any of the props at mine (under 103 K)
 - from interviews learned that it was typical to mine bottom coal out of pillar splits but not out of entries & crosscuts (shouldn't greatly affect stability) (day-shift crew that had been on pillar sections) heard that they were stabbing barrier in area where they skipped pillars
 - grindability of coal 48
 - returned on 8/22 to monitor convergence (mine still removing equip. entry 107)

MICK GAUNA

1/8/08

TRI ADELPHIA

— p96 - Lexan shield for car operator 8/8/07

— ~~to~~ Did you start monitoring convergence
during final week (for 2 elevs - maybe)

— Was there any discussion about spacing (2'±)
- set pressure

— "Red Dust" (everywhere)

— Did you or anybody else contact Strata products
about their recommendations of using ice peps.
(cutly boom) 8/12/07 7 p.m.

— Bumps on 8/11 that you investigated
on 8/12 mid night - how far back
was the ice peps?

— Did Lain Addair call the event in March
on the North Barrier a "Bump"

YES

A BOUNCE

— PLANS (NOT SEEN) under 103 K order (didn't see
any)

Miho Guana

RWS
1-8-8

(T)

4) 1987 - ^{Criminal Central issues} bumps in VA (VP3)

4 pillars bounced out
some injuries (not severe)

Bumps ^{computer} simulation @ Manalapa.

Model investigated there 

Bump in ^{West} VA in 2006 (Rivers Edge Mine) he 2 said in d. report

in 199 Two entry ~~at~~ positions - had to look @ bump potential

14 - Blue gear - several people from world, attended accident

b) Believe Bill Taylor in CC, believe Al Davis on party but not in CC

Stickler gives their opinion

Middle & upper management both interacted

on 8/17
(5) went to South Barrier 2 look @ ground conditions, ~~did~~
~~go by 119 because 120 sounded like working?~~

more to sloughage from 117 to 120, more as you went by

#4 entry - lot of material in 119 m by ^{look at} RC photos 8/17

(-work

②

When back outside on 1st day 8/7, got overview from company (e-commerce, insurance, etc.)
Adam, Zelanka, Luana in this meeting

19 on 2nd day, focused on best entry to advance in equator recommend #1, did analysis to see if #1 was best
everything went to yield on LAMODEL

got Agapito reports, used "higher" values & results changed - Ark Joe Zelanka

~~X~~ ARMA LAMODEL said #2 or #3 should be better entries to try than #1 - but UC-observations showed there were worse than #1
Decided not to go w/ analysis, would evaluate as they advanced

Got everyone together on 8/11, gave report on what Mike & Joe thought happened
Also discussed next support
(call ^{Tom} Barzak before this meeting, Martina rockprop, without coaching)

~~X~~ Joe Zelanka investigate Absideen where Rockprop was used for bump vertical

RWB
1-8-08

34. Everyone relied on each other
relied on Lane Advisor
" on inspectors

- Was concerned to do every thing possible
didn't think it was ~~not~~ doing anything overly dangerous

TS was ones that giving MSHA interference sense
this plan ~~was~~ put together would work

From previous impression, TS (Ventilation) just monitor &
provide info to advisors

Mike felt @ Creighton Canyon was there to just provide
info to advise, not make decisions, to be
there if some critical issue arise

It was company's idea to use rock prop & TS
was to assess & evaluate it

considered ~~to~~ square sets, other

1-8-18
MUR
(4)

Gauna

Met Bob Murray on 8/11 for Wt time
in meeting

Murray was coordinating meeting

Didn't have any personal meetings w/ Murray

Why do you think
so much activity
was continuing?

~~no~~ ~~substitution~~ ~~done~~

Agreed to use history
of ~~the~~ North Pillaring
panels -
should list of these
changed to North
Barriers as per it
failed? Yes

~~Time~~
Re. each leg for

What was used
on top & bottom?

Doesn't have - need
allowing for the
sect & lateral support

What did you think
of NIS report - general sense of NIS report is accurate

Evaluation of
Aspects of ^{causing} ^{location}
analysis [both] ^{of}
think or really
over ID of
reply?

Did any one tell
you that they
felt frame
shake at drill
hole site?

- not a time but since found
out, he would expect
them to happen

Do you think ^{of}
a) ^{of} ^{plan}
could be changed
and so? yes

Did you ^{analyze}
as it advanced?
What was
conclusion
not computer ^{analysis}

Do you have copy
of Healey's ~~report~~
L. A. W. R. R. R.
before 16th
Joe Zing have ^{copy}

8/16 - of A pillar side
would it be
people 1st analysis
that #2 or 3 better?

~~still~~
still felt in
right direction

1-8-08 RWB
(2)

Quana

Ramp could have occurred even if no pillars were taken in South Banner

Pete, Sandy, Radio, Al, Andy, Mike Quana
in further 121 1/2
2125 to 2126

Don't recall if anyone in CC ever told that could
go further - if had more cutters
- Pete wanted to go further if air was ok, but
don't know why it wasn't done

Conditions not different on 17th than 15th,
but failure on 18th was thought it wouldn't happen

Statement

Some opinions may change based on what they find during
their investigation

JGH
1/8/08

Questions for Mike Gauna

The Secretary has assigned this group the task of evaluating MSHA's performance during the period preceding the August 6, 2007 coal bounce at the Crandall Canyon Mine and the subsequent rescue effort. We will also be evaluating issues that were raised during this time period regarding Bob Murray and his interaction with MSHA. This is not an investigation or review of any individual person. It is an administrative review of MSHA's actions as an agency. This evaluation will be presented to the Secretary in the near future, and it is intended that the results of the evaluation will be made public. This interview is being conducted to gather information for this assignment. We also intend to interview a number of other MSHA employees. So that we may obtain unbiased information from all persons to be interviewed, we ask that you not discuss this interview with anyone until all of the interviews have been completed.

[For non-management interviewees: You may have a union representative present if you wish, and may consult with him or her at any time.]

Background/Experience

1. Please state your full name.
Michael Gauna
2. What is your current position in Technical Support? How long have you worked in this position?
since April 2000, Tech Support
3. Briefly describe your work experience before this position.
Conoco Energy
4. Can you tell us about your experience with dealing with bumps?
 - a. Previous investigations conducted, publications authored, etc?
 - b. Have you ever presented training on bumps to industry or MSHA personnel?

5. What experience have you had in District 9 with evaluating or investigating bumps? *2 entry positions for Skyline District & Skyline mines. Had to look @ bump potential in order to grant/deny petitions.*
 - i. Have you ever made any recommendations to D9 in regard to preventing or minimizing bumps?
 - ii. If yes, what were they?

6. What is your definition of a bounce/bump? *bounce - violent explosion of filter rib side that is done instantaneously.*
 - a. Outburst/burst?
 - b. When would a bump or bounce become immediately reportable to MSHA?

*First experience was @ Island Creek mine
has never had any training related to bumps but has other experience with them.*

*outburst = gas pressure
bumps are caused by high stress
doesn't have good feel for when a bounce is reportable. If you have to stop your office mining, then it's reportable.*

1219325 (1190)

- ARMPs gives stability factors for a given mining scenario.
 - MSHA makes more use of ALPS/ARMPs; he uses this more bc it gives a better sense of comparison. Numerical programs (Lamodel) are more complicated/require more time. ALPS/ARMPs give almost immediate feedback. This isn't the case w/ Lamodel.
7. Can you tell us about your training in using ARMPs and/or LAMODEL?
Some MSHA training on ARMPs. Hasn't run Lamodel extensively. Lots of training/exp with Lamodel 20, but not much w/ Lamodel 30.
 8. Can you tell us about your experience in using ARMPs and LAMODEL specifically for evaluating bump potential applications?

Response to the August 6th Event

9. When did you first become aware of the August 6 incident?
Late on August 6th. Didn't leave that day bc there were no flights out of Pittsburgh. Flew out on Tuesday, August 7th. Can't remember who assigned him to go. Arrived around 5pm on Aug. 7th.
10. Was it immediately clear that it was a bump event and that you were being assigned to respond? If not, explain.
11. How quickly were you able to respond?
12. When did you arrive at the mine site?
13. Whom did you report to when you arrived at the mine?
Lawrence Carter
14. Was the MSHA organizational structure clear to you?
 - a. Who was in charge when you arrived at the mine?
Phil Taylor (@ time he showed up)
 - b. Did this change when HQ personnel arrived?
Al Davis; whoever was in the mine before you during that shift.
15. What instructions were you given? By whom?
Go to the south barrier Gary Jensen and one other person went with him. Can't remember who instructed him to do bc for the evaluation. No company people went with them.
16. Who did you interact with from the company?
Laird Adams, who has an engineering background. He was very knowledgeable on Utah conditions and bumps in general.
17. How did this working arrangement with the company come about?
18. Under this arrangement were you able to obtain the necessary technical information that you felt you needed? (maps, geologic information, etc)
19. Were you ever consulted on the plans the operator was submitting for the underground rescue operations?
 - a. What was your involvement in the plan approval process?
20. On August 7th you went underground with Gary Jensen for an initial assessment of the area. What were your first thoughts of what you observed?

Neither Lamodel or ARMPs gives a good assessment of bump predictability. Neither program told the immediacy of a bump.
Mike isn't aware of any software that predict bumps
ARMPs historical experience + Lamodel is the closest thing you can use to predict bump potential.

Showed lots of info of both intermediate & upper level insight.
Evaluation showed more stress in Entries 3 and 4 than in Entries 1 and 2.
This contrasts with what ARMPs/Lamodel showed when they ran these 2 programs bc observations didn't match what the computer programs were showing.

ran ARMPs & Lamodel on the first day he was there. The programs showed that the pills were in yield on the 5th they got the appropriate reports and started running the values they asked. The results changed from when Mike & Joe ran Lamodel & ARMPs.

Tom Barzok - NIOSH; experience of rock props. A series of standing support criteria of used in coal applications.

This entry was on afternoon of 8/11

21. According to Joe Zelanko's notes, on Wednesday August 8th, you and Joe reviewed the proposed mining plan for the rescue effort. What did this

review consist of? Intended to change some of the protocol in entry 1. There was a "refinement meeting" preceding the change. Murray, Reymont, Stuckler, MSHA enforcement all came to the meeting. Don't remember who called the meeting. Rock props were already being ordered shipped or installed. Can't remember which.

22. Based on this initial review, did you recommend any changes?

23. How did the decision to use a Lexan shield for the CM operator come about? I suggested using shield early on 8/8.

24. Was there also any consideration given to providing the shuttle car operators with additional protection? On 8/9 they went up to evaluate protection of shuttle car operators.

25. What did you do on August 8th as far as running ARMPS and LAMODEL?

26. What was your goal with these efforts?

27. Were you successful in getting useful output?

28. Who did you discuss this information with? (From MSHA, and the Company both)

29. Did you make any recommendations based on these models?
a. To whom?
b. Did they consider your recommendations?

30. Did you continue to run additional ARMPS and LAMODEL runs?

31. What input parameters were you changing compared to the initial runs?

32. Did your results alter your thoughts on the rescue effort in any way?

33. Were the decision makers for MSHA available for you to consult with?
a. Did they ever ask you for input or about your concerns? Yes

34. Did you ever feel that the MSHA decision makers were relying on TS to determine if it got too dangerous to continue with the underground operation? No. Everyone was relying on each other. MSHA and mine inspector alike.

- a. Did you feel pressure as being responsible for whether the rescue operation should have continued or not?
- b. Is it normally the function of TS to make these decisions in an operation of this type?
- c. Would the function of TS normally be as advisors to the persons in command, or to be decision makers? Advisors.

Nobody ever gave him instructions as to what TS's role was to be or what Mike's specific role was to be. He just thought he was to be an call for whatever was needed.

Believes rock props had already been prepared by Labor Admin

The Aug 7th plan was approved before Mike went up on his initial evaluation.

From the time he got there everyone was asking which entry they should advance up. "Is one the place to go?" Arlington and people on site were asking him this. He didn't feel comfortable relying on ARMPS/LAMODEL. It wasn't compatible w/ the conditions they encountered on 8/9.

Stuckler & MSHA report was accessible. Everyone was relying heavily on each other.

Garner felt like he was an advisor & provided the info to MSHA. MSHA exhibited a can-sultant. He was the feeling that he didn't have one line was to he was the whether the rescue was to proceed or to stop. Nobody ever told him that it was his duty to make the ultimate decision on whether the rescue proceeds.

- Big bump on 8/11.
- although the support wasn't in place @ the time, he believes if they had been in place, the support would've withstood the bump on 8/11.

35. What did you really feel your role in this operation was? Why?
on-call advisors.

36. With the magnitude of the bounce that occurred and 7% oxygen readings from the # 1 borehole, did you feel there was still a chance of survival of the 6 missing miners?

Leone Adair proposed the use of rock props. TS evaluated the proposal. Talked to Tom Barzack who also suggested props. Cons. direct steel square sets. Props were a proven technology. Props had been used @ Aberdeen. Mine considered ~~rock~~ arches but would require too much of the entry & be cut away if too much cutting of the pillars.

- When did you decide there was no chance of survival?
- Was this ever discussed with the decision making personnel from MSHA?
- What discussions were held about the survival of the missing miners? When?
- Were any MSHA personnel outside the decision makers ever asked if they thought the missing miners survived the original bump? Why not?

People talking amongst themselves that hopefully the miners barricaded after the original bump. Some potential for survival if the miners had moved and barricaded.

37. Did you go underground? *Yes everyday from 8/7 and 8/14 (except the 8th)*

- If yes, what did you think of UG environment where the material was being loaded?
- Did you feel the plans were being carried out as approved? *Yes*
- With what you saw, what did you feel about the chance of the missing miners surviving?

38. Were you underground when any bounces occurred? If so, please describe it.

- If not, how were you getting information from the underground operations concerning when bounces occurred?

39. Have you ever been in a mine when a bounce occurred? Describe. *No*

- Have you ever seen a bounce as extensive as the August 6 bounce?
- Have you ever known of anyone cleaning up material expelled due to a bounce where the entries were almost filled with material? Describe.
- How could any experience with previous bounces be applicable to this in advancing an entry in this area?

thinks that there was enough stress on the pillar that shift of pillar occurred. ~~prop~~ expansion laterally. Similar to "slapping a near smaller fist"

40. What did you think of the barrier and roof moving into the # 1 entry and shearing off the roof bolts?

- Can you describe to us how this occurred?
- What did you think would be the effects of cutting 10 more feet of the barrier as advancement was made in the entry?

doesn't know if the bounces out of material in # 4 and # 1 entries was related to the bumping.

Mike saw out of potential in the # 4 entry on 8/10 for more bumps. Based on visual observations, he still believes they did the right thing by proceeding up the # 1 entry.

41. Were you ever asked to go underground to evaluate safety concerns of the inspectors? *No*

supported by MSHA and entry work party mainly were home / back props

degradation pushing out by in the old main west continued @ least until 8/11. Extra props installed from xc 119 to xc 116. Started supporting # 1 entry outby. Some of them sustained @ gowans Subgenius other company did on its own.

Gary Peacock raised this issue and asked TR to go investigate

- a. If so, what did you do?
 - b. What were the results or any recommendations?
42. Were you aware of any concerns of any rescue workers about the safety of continuing with the underground rescue operations? *At that time, he did not. He now knows about it b/c of being on the accident investigation team. It was after 8/11 that he heard about it.*
- a. Is so, who had the concerns?
 - b. What were the concerns?
 - c. What was done about them?
43. Were you aware that any company workers asked to be removed from the recovery area?
- a. If so, did you talk with them or assign anyone to talk to them as to why they elected to be withdrawn from the underground operation?
 - b. If yes, what were their concerns?
 - c. Did you do anything to address their concerns?
 - d. If not, why?

Request for Keith Heasley to Model

- Contacted Keith on 8/11. wanted him to run Lamodel and he's the expert @ it. Never seriously considered bringing him on site bc his job/training and resources were there @ his office in WV*
- 44. Was it your decision to contact Keith Heasley about doing some modeling? *Mike asked Sticker if it was appropriate to bring some one in, to the site if necessary. Emma approached sticker about it, but it was sticker's idea. sticker said that if they needed help to go ahead and get help*
 - 45. Did you consult with anyone prior to contacting Keith? Who?
 - 46. When did you first contact him? [link to e-mail](#)
 - 47. What did you do to assist him with the modeling?
 - 48. When did you get feedback from Keith?
 - 49. Describe Keith's results.
 - 50. Did his results alter your thinking about any aspect of the rescue effort?
 - 51. Has Keith or any other expert been contracted as part of the official investigative effort? Please explain.

Support Plan

52. According to Joe Zelanko's notes, on August 8th, you and Joe also provided an opinion of the standing support? What did this consist of?

53. Were the Rocprops considered at this time (instead of posts)? Explain.

54. What experience do you have with Rocprops? *None prior to Cranall Canyon*

55. When did the Rocprops become part of the support plan?

56. Were these 40 ton Rocprops? *Yes*

- a. Were they subsequently increased to 50 ton props? *doesn't know; would have to go look.*
- b. Who recommended this change and why?

57. Did you consult NIOSH (Tom Barczk) about the standing support aspect of the support plan? *Yes*

- a. If so, what were his recommendations? *to use rock props. doesn't know how Barczk came to the conclusion that rock props should be used.*

58. Did you solicit any input from local personnel (either MSHA inspectors or company personnel), or did they ever offer input, on the use of Rocprops?

- a. If so, what did this consist of? *doesn't know if their input was solicited*

59. Did anyone ever inform you that Rocprops had been blown out in bumps at other mines? *Heard about it, but not until after 8/16. Well after 8/16.*

- a. If you had known this, how would it have affected your decision to use them? *would not have used rock props if he would've known that they wouldn't support the type of bump that occurred on 8/16*

60. Were you aware of Rocprops becoming dislodged due to shuttle cars bumping them? Did this concern you in any way? *Heard that the props had been set on a tilt, not that shuttle cars were dislodging them*

61. Are you aware of any problems with the Rocprops being installed in a tilted manner?

- a. Did you ever see any that appeared to have been kicked out or moved at the bottom?
 - i. Did you feel they were installed incorrectly?

62. How were the wire ropes being secured on the last prop? *Crosby clamps*

- a. Was this an effective method to insure that the ropes would hold the props in place? *wasn't aware they were wrapping them around the pulleys*
- b. Were any other methods of securing the wire rope considered? *Yes*
 - i. If yes, what were the ways?
 - ii. Why were they not attempted? *didn't know.*

he a, Zelanko don't know how to quantify the energy released on a bounce. Nobody ever told me than rock props had been blown out @ Aberdeen. He later learned about it but it was only a couple props, not a whole area of props. This is what it props are for - to keep it from falling.

is familiar w/ Bill Evers, knows he spent his career out west. Never wondered why Billy wasn't @ the mine.

63. In your opinion, was the material in the # 1 entry serving as support for the barrier and adjacent pillars?

a. What was the effect of removing the material?

64. What set pressure was used for the Rocprops—how was this arrived at? *doesn't know how it was determined.*

a. How was it assured that the correct pressure was applied?

65. Were the Rocprops color-coded based on height? Explain? *Yes.*

a. Was there ever a concern about the recommended set height being exceeded? *Not that he's aware of.*

66. Was there an attempt to calculate a lateral load capacity of the Rocprops at this set pressure? *No. It would've likely had to be done/calculated through NIOSH.*

a. If so, how was it done?

b. What was the result?

67. Would Rocprops not be more designed for vertical support instead of lateral support? *lateral support for containment. This is why they tried to keep entry @ 14 ft.*

a. Why were they considered as support for lateral forces?

68. Do you feel the Rocprops were doing anything to actively prevent a bounce?

a. If yes, what?

b. If no, what was their purpose?

c. If the props were just being used to protect people from material from the ribs, do you think the props would have held the material expelled in the # 4 entry from the bounce on August 7?

69. Did you or Joe Zelanko discuss with Peter Saint the possible use of a bracket for the Rocprops designed to better resist lateral loading?

(pictures) *aint showed them the bracket, but it was after the 8/14 accident. Thinks it was in September but can't remember hearing about it before then, during the rescue.*

a. Did you (or anyone else) investigate this bracket further?

b. If not, why not? (What factors did you consider in this decision?)

70. Did you or anyone have contact with the San Juan mine where the bracket props were developed and used?

a. Did they offer any assistance? *Didn't know SJ had called and offered assistance. Didn't learn of it until after the rescue.*

71. What was used in conjunction with the Rocprops (top and bottom of jacks)?

a. Were there concerns about the wood yielding after the initial set?

You want them to crush and yield in order to give lateral res. stance.

Strictly used for lateral support to dissipate energy, not to prevent a bounce. Didn't know if they were designed for vertical support. Hasnt heard of anything/other props to 100 psi. NIOSH is very high pressure.

believes the brackets definitely have merit, but would need to see it installed. NIOSH should probably test these brackets against wood to see how they compare. (wooden blocks)

72. Can you tell us what you know of any other support methods that were considered? (tunnel liners, arches, etc)
73. Was the support plan re-evaluated at any point in time as the rescue/recovery effort continued? No.

Review of Agapito reports

74. When did you first become aware of the Agapito reports?
When Billy Owens put their reports on the W. Drive. Know of them as a company, but has never been involved w/ any of the work prior to Granddell Canyon.
75. What reports were these? (Dates)
2 reports: 1) North barrier mining (2006) - was never aware of the retreat analysis until the investigation of Granddell Canyon. 2) South barrier mining (2007)
76. Upon learning of the reports, when did you request and receive them?
*July 20, 2006 - report 1
 April 18, 2007 - report 2*
77. What was your initial opinion?
- Calibration wasn't appropriate
78. What did you do to analyze these reports? (Did you attempt to run ARMPs and/or LAMODEL?)
not LAMODEL. ARMPs run on SFS and creating of S/B.
79. What did your analysis of the Agapito evaluation reveal?
not a detailed evaluation. weren't sure why they got the values from LAMODEL. Stability required greater barriers.
80. What do you think of Agapito's use of the following that they used in their original analysis?

- a. Coal strength - low stability need more barrier capacity to hold ground stress.
- b. Elastic modulus of coal - not a sensitive parameter - only used on LAMODEL.
- c. Mine geometry - he probably would've left chain pillar out of equation entirely.
 - i. How they handled the bleeder pillar in their evaluation?
- d. LAMODEL yielding zones
 - i. In the Jul 20th report do you feel that this cross section is realistic - the fact that it shows such high stress levels dissipating in such a short distance and not loading up the adjacent pillars?
- e. Stability factor calibrated for mine appears to be where the mine had trouble.

81. Are you aware of the NIOSH work in 2002 to update the initial ARMPs software with more case studies of mines with deeper overburden? Yes, but would not likely have recognized any differences w/c he had just started working w/ ARMPs in 2002.

- a. Specifically, have you reviewed the NIOSH paper entitled "Deep Cover Pillar Extraction In The US Coalfields"?
- b. One aspect of this paper emphasizes the importance of barrier pillars to prevent bumps. The paper concludes that for the NIOSH

let was hard to evaluate reports well, so he couldn't print them off in color, did not have color printer handy.

Agapito used 900 not 1000 under ARMPs. They used 1000 under LAMODEL.

TS - run default values when you use the better results. They should've used something lower under LAMODEL (has way to be liberal. Don't know which value, but it should've been lower.

Opinion had forgotten about this, but 2002 was had in the roof control specialists meeting in the past.

database of case histories, when a Barrier Pillar Stability Factor of 1.9 was achieved, no bumps occurred. Are you aware that this information is discussed and available in the ARMPS help files?

Surprised that not more was done, yes

c. In light of this, were you surprised that the BPSF was not analyzed for Crandall Canyon as part of the District 9 ARMPS evaluation? Didn't know this @ the time. Became aware during the AI.

Laine didn't show the pics of the North Barr. or Factor. The BPS history was basically for North Barrier's benefit

82. When did you first become aware of the March 11, 2007 bump in the North Barrier? during the rescue effort. Laine told him some time after about the March bump. But Laine didn't give him the full story about what happened. on 5/13 Laine got him more history of the bump in written, but it was largely exactly like the info he had given him on 5/11

83. Considering the circumstances of the March 11th bump (retreat mining under an area of 2000 ft of cover) and the fact that the upcoming mining in the South Barrier would essentially duplicate this scenario, should the plan to mine the South Barrier been approved? No. Needed all the info in order to evaluate it properly. Could've taken failure in North to evaluate mining in South. It could've set a new calibration point for evaluation of the south plan.

more analysis/investigation should've been done before approving plan for South

84. Did anybody discuss the March bump with you while you were at Crandall Canyon?

a. If so, please explain.

85. At the time you first heard of this bump did you consider it reportable under Part 50? If not, why not? Yes b/c they had to quit mining there and b/c Agapito mentioned it in their report.

86. When did you first become aware of the April 18, 2007 Agapito report discussing the March 2007 bump?

a. Are you aware of the statement in this Agapito report that discusses the March 2007 bump in the North Barrier retreat section, (highlighted here) describing it like this: "A large bump occurred at this point resulting in heavy damage to the entries located between XCs 133 and 139? The remaining north panel was abandoned in favor of mining the south barrier."

b. Based on this description of the March bump, do you believe that retreat mining in the North Barrier was stopped simply because of bleeder entry stability?

c. In light of this description, should an ARMPS or LAMODEL analysis be re-ran at this time using the North Barrier as historical mine data? Yes, ARMPS or ARMPS b/c something was wrong w/ the LAMODEL results.

87. Were you aware of the pictures taken by mine management during Agapito's March 16, 2007 visit to the bump area? (refer to photos)

88. If you had investigated the March bump and saw damage such as is shown in these photos, would you have considered this as a failure in the ARMPS "groundproofing" scheme of things? (Essentially would you have considered this a new "failure" point in the ARMPS database—at the

ARMPS SF of .53 - thus calling into question the validity of the Agapito claim that the 1st North historical analysis was valid?)

- a. Would you have then asked the mine for additional justification to retreat mine in the South?

89. The roof control plan amendment submitted on May 16, 2007, and approved June 15, 2007, for the South Barrier states: "Consultant reports indicate the development will avoid the majority of the side abutment stress transferred from the adjacent longwall panels. These assessments have been validated by conditions experienced in the mine." This amendment was submitted after the bounce in the North Barrier caused mining to cease there.

- a. In your opinion, how did the operator justify this statement in light of the bounce in the North Barrier? *Doesn't know.*
- b. Based on available information, should the plan to retreat in the South Barrier have been approved? *Knowing all the facts now, No.*

Increasing width provides more detailed protection than increasing the length

90. The roof control plan addendum approved March 8, 2007 specified the same pillar size as the Nov. 21, 2006 plan addendum (80' by 90'). After the March 10, 2007 bump in the North barrier, Agapito recommended by letter dated April 18, 2007 that the crosscut centers be increased to 129' in the south barrier.

- a. Also Agapito had stated in their July 20, 2006 report that increasing crosscut spacing is not expected to significantly improve ground conditions, then in April 18, 2007 after evaluating the bump in the North barrier, they stated that the additional 37 foot pillar length would increase the coal strength of the pillars' confined cores which helps to isolate bumps to the face and reduce the risk of larger bumps overrunning crews in outby locations.
- b. What is your opinion of this apparent contradiction and oversight?
It is a contradiction. It doesn't offer any, or only marginally more, protection.

Increasing width provides more detailed protection than increasing the length

91. When comparing this roof control plan amendment with this ventilation plan amendment, they appear to conflict in allowing the operator to extract the three pillars between the # 1 and # 2 entries in by cross-cut 139.

What is your opinion of this? *wouldn't have thought it was an issue bc you are leaving 3 pillars, not just 2 or 3 pillars, and they are doing it under shallower coverage.*

92. Also in regard to leaving the additional pillars from x-cut 139 to 142, this would appear to be in conflict with the April 18, 2007 Agapito report which cautions: "Skipping pillars should be avoided in the south barrier, particularly under the deepest cover." Would this concern you?

- a. Should an ARMPS or LAMODEL evaluation have been conducted taking the skipped pillars into account? In your opinion, what would it have shown?

They shouldn't have done report, but according to 17 e and according to 17 e would not have thought to be a problem bc they left more than 40' wide pillars & 17 was the deepest cover, and that of mine.

Has never been
can other mine
drive entries up
the barrier
- up to
750' to 800' is
shallow cover in his opinion

93. What was your first thought when you saw the map showing the barrier pillars being mined at Crandall Canyon? *It's a "pretty aggressive plan!" first saw map on site*
a. Are you familiar with any other mines that have or are mining barrier pillars in similar depths of cover?
b. What is your opinion of it? *its able to be done under shallower conditions. Concept can be done as long as you dont have pillars under street.*

94. What is your interpretation of mining bottom coal?
95. Were you aware that bottom coal was being mined at Crandall Canyon?
a. Would the increased mining height have affected the stability of the barrier and pillars?

if you mine greater than 8 ft (if that's the parameter used in the ARMP's model) then it decreases the stability factor. It depends some on where the extra height is taken from.

96. Did any of the ARMPs analyses conducted by the District or Agapito consider a mined height greater than 8 feet?
97. Did any of Agapito's LAMODEL analyses consider a mined height greater than 8 feet?

Day shift ~~person~~ person on 8/10 (morning) told gorman on coal from Crandall canyon. Slabbing barrier pillar too. About 10 people were there, many of them were there had been that there had been floor beside this conversation was @ FAB @ 11am crew members from pillar day shift. Slabbing and bottom mining was contrary to the approved plan. There has been some conflicting testimony since there was slabbing and whether there was bottom mining and

98. Have you obtained other Agapito reports as part of the investigation?
a. What have these reports revealed?

Aberdeen Mine

99. What type of work has TS done at the Aberdeen mine? *Fatality investigation. Not sure if any other work by TS has been done there.*

100. Did you or other Roof Control Division personnel visit the Aberdeen mine with Billy Owens on May 23, 2007? *Yes visited 3 weeks out, but gorman cant remember why maybe related to the longwall.*
a. Why?
b. What were the results of this visit?

Use of Seismic Data

101. When did you first contact the University of Utah concerning the seismic data? *Edan contacted them not sure when*

102. Did you consider contacting them at any time prior to this?

103. Was using the seismic data considered as a way to analyze the frequency and severity of bumps during the rescue operation? (As a predictive tool) *Didn't think it was used.*

104. What was the thought process concerning the seismic data?
Notation to be used to access what was going on in the region, but isn't positive about this.

105. Why contact them on August 29th?
Doesn't know gurn was still @ Cranford camp @ that time & he didn't contact them.

106. Did you see or analyze seismic logs relating to bumping underground during the rescue operation? (Show bump activity log) *No*

- a. Were you aware of the bounce that occurred on the early morning hours of August 7? *Yes, but doesn't know what caused it.*
- b. If so, what was your opinion of this?
- c. Did removing the material in the # 4 entry have any effect on causing this bounce?
- d. Would removing the material in the # 1 entry not cause the same effect? *Removing coal from any entry would slightly reduce the stress. Because it was ~~stable~~ rubble, it wasn't going a lot of support. Smaller bounces could be based on removal of ~~the~~ rubble.*

gurn only saw one log but didn't do anything w/ the info

the mtn was continuing to bounce w/ it hadnt stabilized. After 8/7 bounce, the mtn seemed to have stabilized some. gurn did not hear det of bumping from 8/9 ~~on~~ 8/11. gurn left on 8/14 and returned to mine in 8/22 to monitor convergence and monitor ^{some} people pulling equipment entry 2-107.

gurn was @ the mine every day from 8/7 to 8/14. No daily bumping before gurn. Took it upon themselves to inquire and to look @ the log books. No debriefing or instructions to debrief. gurn did go to command center every time he came out to give updates to whoever was in the command center.

Did you analyze frequency of bumps or severity of bumps from reports of the underground crews and the logs? *No. Wasnt being fabricated @ to mikes knowledge.*

- a. If not, was anyone assigned anyone to evaluate the frequency and severity of bumps that were occurring?
- b. Did this analysis give you any reservations about continuing with the rescue operation because of the frequency or severity of the bumps?
- c. Did you or anyone else suggest stopping the rescue operation because of the recurring bumps? If so, to whom?
- d. Did anyone ever ask your opinion about whether or not the UG rescue operation should continue? If so, who?

Convergence Stations

108. When and why did you install the convergence stations?
*Capalski
gurn didn't install them, ~~the~~ ~~did~~ the installation after gurn left on 8/14*

109. How did you decide on the locations?

110. How often did you take readings?

111. What did the readings reveal?

- a. What good did the convergence stations do?

112. Was there any correlation between the bumps reported and convergence?

113. Were the readings routinely passed on to the command center? The company?

BLM Contacts and Reports

114. When did you first contact BLM?

115. Did you meet someone in Price? When?

116. How did this come about?

117. What information did you obtain? (Reports, geologic logs) (Did they get more than the four reports that we have? Link to BLM reports 1/24/05; 3/05/07; 7/12/07; 8/13/07) Found out about Falk reports ~~about~~ following Kennedy center request.

118. Did you follow-up with a meeting in Salt Lake City?
~~No. [unclear] [unclear] [unclear] [unclear]~~

119. What did you learn from this?

Ground Control Experts

120. Who suggested that the panel of ground control experts be convened?

121. When was this?

122. Was consulting outside experts considered earlier than this date?

a. If so, when?

b. Why were they not consulted before the August 16 accident?

~~Doesn't know~~

123. Who had input into the selection of the experts? (Was the company involved in the selection process?) ~~Paul [unclear] Central division but doesn't know for sure. Was told that company had some input. That's hard info.~~

124. When did the experts get on site?

125. Did the expert committee travel underground? (Why not?)

~~No. Doesn't know why.~~

126. Who briefed them? ~~doesn't know.~~

127. What did the panel conclude? Was a formal statement issued?

Only contact was w/ Mr. Kohler. Never met Steve Falk.

128. How well do you know Billy Owens?
- a. Do you know what his background concerning bounces?
129. What do you think about Billy Owens experience in ground control?
130. Why was Billy not brought to the mine site during the rescue?
- a. Did you ever consult with Billy during the rescue operation about what his opinions would be? *No, but Jensen had communication w/ Billy, but doesn't know what the conversation included.*
- i. Why or why not? If yes, what did he recommend?
131. In your opinion, has D9 ever made a concerted effort to prevent or reduce bounces? *always made an effort. Don't know if it was a "concerted effort." Don't know that there was a specific emphasis on bounces.*
- a. What are they?
- b. Have they ever contacted TS for help concerning preventing or reducing bounces? *on individual injuries/reports. Project by-project only.*
- c. What do you feel about the use of shielding and body armor for protection from bounces as opposed to preventing or reducing bounces? *Its good, but armor can't be used in lieu of proper mine design.*

Investigation Team's UG Visit to Crandall Canyon

132. Who made the decision for the Accident Investigation Team to revisit the scene of the August 16th bump? *Group decision among the team.*
133. When did you do this? *Every member of team went over 2 day period*
134. How far in by were you able to travel? *in by x 120. Even members of AI team. No company people or miners rep. They elected not to go based on advice from legal counsel*
135. Did representatives of the Company or the miners accompany you? *No*
136. How was it determined that it was safe for the team to do this?

Additional Questions

137. The Roof Control Division tracking sheets show that Bill Knepp requested Technical Support assistance for the Aberdeen Mine in May 2007. ([link to tracking sheet](#)) Were you aware of this request when it was first made?

138. Do you have any knowledge of a request for assistance for the Crandall Canyon Mine being made at the same time as this request?

139. Is there anything else you would like to tell us that we may not have asked you?

This is all the questions we have for you at this time. We may have more questions in the future. If so, we will contact you and set up a follow up interview. If at a later time you think of something additional you would like to tell us or think we should be aware of, please let us know.

Would you agree to not discuss this interview with anyone else in order that we may obtain unbiased information from future interviewees?

Thank you.

- Never met Murray before Crandall Canyon. He was in the 8/11 meeting.
No personal dealings w/ Murray.
- ~~Bill~~ Murray did express desire for things to move faster, but didn't hear a comment from him about MSHA slowing ~~things~~ things down.

AKG
1-8-08

Questions for Mike Gauna

The Secretary has assigned this group the task of evaluating MSHA's performance during the period preceding the August 6, 2007 coal bounce at the Crandall Canyon Mine and the subsequent rescue effort. We will also be evaluating issues that were raised during this time period regarding Bob Murray and his interaction with MSHA. This is not an investigation or review of any individual person. It is an administrative review of MSHA's actions as an agency. This evaluation will be presented to the Secretary in the near future, and it is intended that the results of the evaluation will be made public. This interview is being conducted to gather information for this assignment. We also intend to interview a number of other MSHA employees. So that we may obtain unbiased information from all persons to be interviewed, we ask that you not discuss this interview with anyone until all of the interviews have been completed.

[For non-management interviewees: You may have a union representative present if you wish, and may consult with him or her at any time.]

Background/Experience

1. Please state your full name. *Michael Gauna*
2. What is your current position in Technical Support? How long have you worked in this position? *Engineer April 2000*
3. Briefly describe your work experience before this position. *Coal 3 yrs*
4. Can you tell us about your experience with dealing with bumps? *TRR, Island Creek Coal, etc*
 - a. Previous investigations conducted, publications authored, etc?
 - b. Have you ever presented training on bumps to industry or MSHA personnel?
5. What experience have you had in District 9 with evaluating or investigating bumps?
 - i. Have you ever made any recommendations to D9 in regard to preventing or minimizing bumps?
 - ii. If yes, what were they?

USM RI (2384)
(7)
4325

6. What is your definition of a bounce/bump? *- violent expulsion of pillar rib side*
 - a. Outburst/burst? *Small, med, large*
 - b. When would a bump or bounce become immediately reportable to MSHA? *Don't have a good feel for it (disrupts normal activity)*
Causes - high stress on air body

out flow of air

used different type in industry
but similar

has not run LAMODEL 3D
used LAMODEL D2

7. Can you tell us about your training in using ARMPs and/or LAMODEL?

Training seminar when joined MSHA

8. Can you tell us about your experience in using ARMPs and LAMODEL specifically for evaluating bump potential applications?

ARMPs & ALPS give you stability factors for an area
LAMODEL - gives you sense of where stress is concentrated (hot spots)

(@River Edge) collect after every

Response to the August 6th Event

Does not flush either system help determine bump areas

9. When did you first become aware of the August 6 incident?

Monday 8/16 - when vent group sent out thought it was an explosion

10. Was it immediately clear that it was a bump event and that you were being assigned to respond? If not, explain.

11. How quickly were you able to respond?

left Tuesday early

For Acting Supervisor sent him to report for ground control

12. When did you arrive at the mine site?

2:5 pm on 8/17 Tor 2 + Mike traveled together

13. Whom did you report to when you arrived at the mine?

to Command Center

14. Was the MSHA organizational structure clear to you? Blue case there

a. Who was in charge when you arrived at the mine? -

b. Did this change when HQ personnel arrived? Not from Mike's perspective -

whoever was in Blue case was who was in

15. What instructions were you given? By whom?

go to 06 & evaluate conditions to see where to focus rescue efforts

16. Who did you interact with from the company? no one 1st day

came down later

17. How did this working arrangement with the company come about?

18. Under this arrangement were you able to obtain the necessary technical information that you felt you needed? (maps, geologic information, etc)

got enough to start @ 1st, got better stuff later

19. Were you ever consulted on the plans the operator was submitting for the underground rescue operations?

a. What was your involvement in the plan approval process?

see attached

20. On August 7th you went underground with Gary Jensen for an initial assessment of the area. What were your first thoughts of what you observed?

#4 entry still working

#1 entry best place to try

#2 & 3 had watered in them

ARMPs/ALPS
goes to
dist. etc
more

backed
Gary Jensen
from some briefs
was briefed some
time going to
8/17
going under
& when under,
no real
breathing

none in #4,
#1 didn't
appear to be
working

21. According to Joe Zelanko's notes, on Wednesday August 8th, you and Joe reviewed the proposed mining plan for the rescue effort. What did this review consist of?
22. Based on this initial review, did you recommend any changes?
23. How did the decision to use a Lexan shield for the CM operator come about? *remembering why in ~~of~~ D why Fork? in hly*
24. Was there also any consideration given to providing the shuttle car operators with additional protection? *yes shield on 8/19*
25. What did you do on August 8th as far as running ARMPS and LAMODEL?
26. What was your goal with these efforts?
27. Were you successful in getting useful output?
28. Who did you discuss this information with? (From MSHA, and the Company both)
29. Did you make any recommendations based on these models?
 - a. To whom?
 - b. Did they consider your recommendations?
30. Did you continue to run additional ARMPS and LAMODEL runs?
31. What input parameters were you changing compared to the initial runs?
32. Did your results alter your thoughts on the rescue effort in any way?
33. Were the decision makers for MSHA available for you to consult with?
 - a. Did they ever ask you for input or about your concerns?
34. Did you ever feel that the MSHA decision makers were relying on TS to determine if it got too dangerous to continue with the underground operation?
 - a. Did you feel pressure as being responsible for whether the rescue operation should have continued or not?
 - b. Is it normally the function of TS to make these decisions in an operation of this type?
 - c. Would the function of TS normally be as advisors to the persons in command, or to be decision makers?

*involved
never been in MR like this
before, only other time @ GY mine fire
just a consultant*

*Mike Gava felt he was advisor not decision maker
felt decision to stop would have been all encompassing of
everyone*

Company was asked to get
correct topography, never had a
mine there, Mike didn't get it until
he got back home at 8/16

35. What did you really feel your role in this operation was? Why?

36. With the magnitude of the bounce that occurred and 7% oxygen readings from the # 1 borehole, did you feel there was still a chance of survival of the 6 missing miners? *yes, because 4 1/2 min. to get to next to occur, they had time to*

- a. When did you decide there was no chance of survival?
- b. Was this ever discussed with the decision making personnel from MSHA?
- c. What discussions were held about the survival of the missing miners? When?
- d. Were any MSHA personnel outside the decision makers ever asked if they thought the missing miners survived the original bump? Why not?

*with a log
way
thought it
started under
disposit cover
D. J. Smith
about amount
of dust that
could be
generated from
bounce of
that magnitude*

37. Did you go underground? *yes*

- a. If yes, what did you think of UG environment where the material was being loaded?
- b. Did you feel the plans were being carried out as approved?
- c. With what you saw, what did you feel about the chance of the missing miners surviving?

38. Were you underground when any bounces occurred? If so, please describe it. *only once, but not in vicinity*

- a. If not, how were you getting information from the underground operations concerning when bounces occurred?

39. Have you ever been in a mine when a bounce occurred? Describe *no*

- a. Have you ever seen a bounce as extensive as the August 6 bounce?
- b. Have you ever known of anyone cleaning up material expelled due to a bounce where the entries were almost filled with material? Describe.
- c. How could any experience with previous bounces be applicable to this in advancing an entry in this area?

40. What did you think of the barrier and roof moving into the # 1 entry and shearing off the roof bolts?

- a. Can you describe to us how this occurred?
- b. What did you think would be the effects of cutting 10 more feet of the barrier as advancement was made in the entry?

*enough stress that
sh. off coal*

thought was working in an area that had been distressed

41. Were you ever asked to go underground to evaluate safety concerns of the inspectors? *no*

- a. If so, what did you do?
 - b. What were the results or any recommendations?
42. Were you aware of any concerns of any rescue workers about the safety of continuing with the underground rescue operations? *recovery area 2/17*
- a. If so, who had the concerns?
 - b. What were the concerns?
 - c. What was done about them?
43. Were you aware that any company workers asked to be removed from the recovery area? *not while he was on site thinks it was after 16th*
- a. If so, did you talk with them or assign anyone to talk to them as to why they elected to be withdrawn from the underground operation? *just he heard it*
 - b. If yes, what were their concerns?
 - c. Did you do anything to address their concerns?
 - d. If not, why?

Request for Keith Heasley to Model

*Heasley
"if anybody you can help"*

44. Was it your decision to contact Keith Heasley about doing some modeling? *didn't bring on site because he had all gear with @ bus office*
45. Did you consult with anyone prior to contacting Keith? Who? *11th?*
46. When did you first contact him? *(link to e-mail)*
47. What did you do to assist him with the modeling?
48. When did you get feedback from Keith? *9/14 2002*
49. Describe Keith's results. *could disagree between the 2 which he had after*
50. Did his results alter your thinking about any aspect of the rescue effort? *(it was used by panel of consultants after 16th)*
51. Has Keith or any other expert been contracted as part of the official investigative effort? Please explain. *yes - he is doing modeling*

Support Plan

52. According to Joe Zelanko's notes, on August 8th, you and Joe also provided an opinion of the standing support? What did this consist of?
used 6x8 instead of 8x8 since 6x8 was handwood

53. Were the Rocprops considered at this time (instead of posts)? Explain.

54. What experience do you have with Rocprops? *none besides this*

55. When did the Rocprops become part of the support plan?
have don't remember, have to look @ plans

56. Were these 40 ton Rocprops? - 40 tons were used
a. Were they subsequently increased to 50 ton props? *not aware of it*
b. Who recommended this change and why?

57. Did you consult NIOSH (Tom Barczk) about the standing support aspect of the support plan?
a. If so, what were his recommendations? *for bumps, from conditions, Roc props were thing to be used
preferred props more than any other standing support*

58. Did you solicit any input from local personnel (either MSHA inspectors or company personnel), or did they ever offer input, on the use of Rocprops?
a. If so, what did this consist of? *doesn't know*

59. Did anyone ever inform you that Rocprops had been blown out in bumps at other mines? *no think he heard about it after 16th*
a. If you had known this, how would it have affected your decision to use them? *X would have said we can use this type support system but have felt that a bump could happen in the entry*

60. Were you aware of Rocprops becoming dislodged due to shuttle cars bumping them? Did this concern you in any way?
No knew it (had there was a concern about tilt, may shuttle cars would then sit on way) bump on 7th was conceivable to take out Rocprops

61. Are you aware of any problems with the Rocprops being installed in a tilted manner? *knew some were tilted, don't know why*
a. Did you ever see any that appeared to have been kicked out or moved at the bottom?
i. Did you feel they were installed incorrectly?

62. How were the wire ropes being secured on the last prop? *crosby clamps, think stopped on bottom props*
a. Was this an effective method to insure that the ropes would hold the props in place?
b. Were any other methods of securing the wire rope considered?

anchor top rope to roof bolts
i. If yes, what were the ways?
ii. Why were they not attempted? *not aware they were used on one pillar @ Abandon*

thought Taylor & Farnell was involved in plans approval, so thought they ~~was~~ felt Roc props were ok

63. In your opinion, was the material in the # 1 entry serving as support for the barrier and adjacent pillars?

a. What was the effect of removing the material?

64. What set pressure was used for the Rocprops—how was this arrived at? *don't know*

a. How was it assured that the correct pressure was applied?

65. Were the Rocprops color-coded based on height? Explain. *diff. set heights / different colors*

a. Was there ever a concern about the recommended set height being exceeded? *not they were aware of*

66. Was there an attempt to calculate a lateral load capacity of the Rocprops at this set pressure? *Not aware of it being done, NIOSH would have to do this*

a. If so, how was it done?

b. What was the result?

67. Would Rocprops not be more designed for vertical support instead of lateral support?

His understanding a. Why were they considered as support for lateral forces?

This would withstand lateral support due to pressurized against roof & floor

68. Do you feel the Rocprops were doing anything to actively prevent a bounce? *would withstand but not support*

a. If yes, what? *strictly for lateral support*

b. If no, what was their purpose?

c. If the props were just being used to protect people from material from the ribs, do you think the props would have held the material expelled in the # 4 entry from the bounce on August 7?

don't know what props were originally designed for, if designed for lateral pressure

69. Did you or Joe Zelanko discuss with Peter Saint the possible use of a bracket for the Rocprops designed to better resist lateral loading?

(pictures) *Peter Saint showed him bracket until after 9/16 (maybe September)*

a. Did you (or anyone else) investigate this bracket further?

b. If not, why not? (What factors did you consider in this decision?)

Doesn't recall being mentioned before

70. Did you or anyone have contact with the San Juan mine where the bracket props were developed and used?

a. Did they offer any assistance?

never told that or saw brackets until September

71. What was used in conjunction with the Rocprops (top and bottom of jacks)? *wood*

a. Were there concerns about the wood yielding after the initial set?

wanted it to yield, it would lock into rock

bases using wood because that is what he thought they were used @ Aberdeen

-Thinks it may have meant one wood

72. Can you tell us what you know of any other support methods that were considered? (tunnel liners, arches, etc) *arches - too much material to move square sets, too much take up too much room*
73. Was the support plan re-evaluated at any point in time as the rescue/recovery effort continued? *No - only evaluation was to see if they wanted to move to another entry*

Review of Agapito reports

74. When did you first become aware of the Agapito reports?

8/7 or 8/8

75. What reports were these? (Dates)

Review of 2 reports - North Cherokee July 20, 2006 South Cherokee 7/18/07

76. Upon learning of the reports, when did you request and receive them? *only after Billy 8/18*

77. What was your initial opinion? *didn't feel comfortable with cross section (Figure 20) with history they used*

78. What did you do to analyze these reports? (Did you attempt to run ARMP5 and/or LAMODEL?)

79. What did your analysis of the Agapito evaluation reveal?

80. What do you think of Agapito's use of the following that they used in their original analysis?

too not enough for barrier was not enough barrier support pillars left (not enough barrier capacity)

- a. Coal strength *- at time didn't know, now, it appears too liberal*
- b. Elastic modulus of coal *- should not vary so much in coal, Agapito used too high value*
- c. Mine geometry *[should use "real" width]*
 - i. How they handled the bleeder pillar in their evaluation? *they overestimated strength of bleeder pillar*
- d. LAMODEL yielding zones
 - i. In the Jul 20th report do you feel that this cross section is realistic - the fact that it shows such high stress levels dissipating in such a short distance and not loading up the adjacent pillars? *felt it would over-stress*
- e. Stability factor calibrated for mine appears to be where the mine had trouble.

81. Are you aware of the NIOSH work in 2002 to update the initial ARMP5 software with more case studies of mines with deeper overburden?

was aware they did work he has seen work w/ NIOSH long

- a. Specifically, have you reviewed the NIOSH paper entitled "Deep Cover Pillar Extraction In The US Coalfields"?
- b. One aspect of this paper emphasizes the importance of barrier pillars to prevent bumps. The paper concludes that for the NIOSH

database of case histories, when a Barrier Pillar Stability Factor of 1.9 was achieved, no bumps occurred. Are you aware that this information is discussed and available in the ARMPS help files?

Too 2 remember
Mike didn't remember
right away -

c. In light of this, were you surprised that the BPSF was not analyzed for Crandall Canyon as part of the District 9 ARMPS evaluation?

became aware during current investigation, was surprised would not have

82. When did you first become aware of the March 11, 2007 bump in the North Barrier? during mine overview of Lane Adair sometime after 8/8

83. Considering the circumstances of the March 11th bump (retreat mining under an area of 2000 ft of cover) and the fact that the upcoming mining in the South Barrier would essentially duplicate this scenario, should the plan to mine the South Barrier been approved? in August, wasn't sure of bump extent but at time thought it should have been looked @ more

walk that info
L.A. MODEL was
caused, showed
no signs coming
from North

84. Did anybody discuss the March bump with you while you were at Crandall Canyon? Lane Adair during mine overview

a. If so, please explain.

North should
be new
failure
point

85. At the time you first heard of this bump did you consider it reportable under Part 50? If not, why not? He would have thought it should be reported

86. When did you first become aware of the April 18, 2007 Agapito report discussing the March 2007 bump?

a. Are you aware of the statement in this Agapito report that discusses the March 2007 bump in the North Barrier retreat section, (highlighted here) describing it like this: "A large bump occurred at this point resulting in heavy damage to the entries located between XCs 133 and 139? The remaining north panel was abandoned in favor of mining the south barrier."

b. Based on this description of the March bump, do you believe that retreat mining in the North Barrier was stopped simply because of bleeder entry stability? Didn't have full sense of extent when he first read

c. In light of this description, should an ARMPS or LAMODEL analysis be re-ran at this time using the North Barrier as historical mine data? this should have been new failure point should have been re-run

that report
but he didn't
thought it was
more because
they had
deeper work
ahead & didn't
want more
problems

87. Were you aware of the pictures taken by mine management during Agapito's March 16, 2007 visit to the bump area? (refer to photos) not until accident investigation started

88. If you had investigated the March bump and saw damage such as is shown in these photos, would you have considered this as a failure in the ARMPS "groundproofing" scheme of things? (Essentially would you have considered this a new "failure" point in the ARMPS database—at the

but he had
sense of North
Bump when he
saw photos that
what he saw
same

combination of barrier pillar + yield pillar must be taken into account - Not just 1.9 BPSF oh to make

ARMPS SF of .53 - thus calling into question the validity of the Agapito claim that the 1st North historical analysis was valid?
 C.53 oh - BPSF may not be high enough if only C.53 for pillar

a. Would you have then asked the mine for additional justification to retreat mine in the South?

89. The roof control plan amendment submitted on May 16, 2007, and approved June 15, 2007, for the South Barrier states: "Consultant reports indicate the development will avoid the majority of the side abutment stress transferred from the adjacent longwall panels. These assessments have been validated by conditions experienced in the mine." This amendment was submitted after the bounce in the North Barrier caused mining to cease there.

doesn't know the reason for this statement.

a. In your opinion, how did the operator justify this statement in light of the bounce in the North Barrier?

operator states that bump happened in North because they skipped pillars

b. Based on available information, should the plan to retreat in the South Barrier have been approved?
 knowing what we know now, he doesn't think it should be approved

90. The roof control plan addendum approved March 8, 2007 specified the same pillar size as the Nov. 21, 2006 plan addendum (80' by 90'). After the March 10, 2007 bump in the North barrier, Agapito recommended by letter dated April 18, 2007 that the crosscut centers be increased to 129' in the south barrier.

more likely because stress was from North

a. Also Agapito had stated in their July 20, 2006 report that increasing crosscut spacing is not expected to significantly improve ground conditions, then in April 18, 2007 after evaluating the bump in the North barrier, they stated that the additional 37 foot pillar length would increase the coal strength of the pillars' confined cores which helps to isolate bumps to the face and reduce the risk of larger bumps overrunning crews in outby locations.

it was not because pillars skipped

b. What is your opinion of this apparent contradiction and oversight?

it is a contradiction because when you pull pillar, you are getting same length/pressure that pillars were in other panel

91. When comparing this roof control plan amendment with this ventilation plan amendment, they appear to conflict in allowing the operator to extract the three pillars between the # 1 and # 2 entries in by cross-cut 139.

What is your opinion of this?
 thought they could live with it because it would use deepest cover; (AJ team is doing analysis to see if it is an issue)

92. Also in regard to leaving the additional pillars from x-cut 139 to 142, this would appear to be in conflict with the April 18, 2007 Agapito report which cautions: "Skipping pillars should be avoided in the south barrier, particularly under the deepest cover." Would this concern you?

a. Should an ARMPS or LAMODEL evaluation have been conducted taking the skipped pillars into account? In your opinion, what would it have shown?

Joe & can give better information

(Skipper pillar is not stable)

Not seen any other mines where this was done

Main South Barriers is different animal than North & South Barriers from Park analysis - Can't compare May since South Main oh can do "Barriers"

93. What was your first thought when you saw the map showing the barrier pillars being mined at Crandall Canyon?

- a. Are you familiar with any other mines that have or are mining barrier pillars in similar depths of cover? No
- b. What is your opinion of it? - think it is doable under shallow conditions (concept can be done if pillars are not overstressed) (20' to 30' or less)

94. What is your interpretation of mining bottom coal?

95. Were you aware that bottom coal was being mined at Crandall Canyon?

- a. Would the increased mining height have affected the stability of the barrier and pillars? a little bit - Pillar strength is proportional to mining height - can depend on if

96. Did any of the ARMPS analyses conducted by the District or Agapito consider a mined height greater than 8 feet?

97. Did any of Agapito's LAMODEL analyses consider a mined height greater than 8 feet?

98. Have you obtained other Agapito reports as part of the investigation?

- a. What have these reports revealed?

Agapito's analysis look suspect because they didn't show barrier pillar stress

tabular entry of from pillar of barrier - (pretty much useless)

Aberdeen Mine

99. What type of work has TS done at the Aberdeen mine? identify some locations, stability

100. Did you or other Roof Control Division personnel visit the Aberdeen mine with Billy Owens on May 23, 2007? TS did but not Mine -

- a. Why?
- b. What were the results of this visit?

Not sure why, maybe long wall ~~long~~ problems

Use of Seismic Data

101. When did you first contact the University of Utah concerning the seismic data? Joe Z or Tom M did

102. Did you consider contacting them at any time prior to this? Joe Z had resource contact so he called them

103. Was using the seismic data considered as a way to analyze the frequency and severity of bumps during the rescue operation? (As a predictive tool) Don't know if it was looked @ during -

University of Utah had a high level of sensitivity, only picked up big events

104. What was the thought process concerning the seismic data?
could be used to assess what was going on in area (Joe Z will be better to talk to)
105. Why contact them on August 29th?
Don't know - he didn't contact them

106. Did you see or analyze seismic logs relating to bumping underground during the rescue operation? (Show bump activity log)
no only saw seismic log from engineering
- a. Were you aware of the bounce that occurred on the early morning hours of August 7?
Yes this is 8/6 bump
- b. If so, what was your opinion of this?
Don't know
- c. Did removing the material in the # 4 entry have any effect on causing this bounce?
Maybe
- d. Would removing the material in the # 1 entry not cause the same effect?
it would tend a slight stress redistribution to other surrounding pillars

107. Did you analyze frequency of bumps or severity of bumps from reports of the underground crews and the logs?
when they got there in many, they noticed what happened last time
- a. If not, was anyone assigned anyone to evaluate the frequency and severity of bumps that were occurring?
it was up to them to check on books
- b. Did this analysis give you any reservations about continuing with the rescue operation because of the frequency or severity of the bumps?
No one
- c. Did you or anyone else suggest stopping the rescue operation because of the recurring bumps? If so, to whom?
Frank & equipment could not do it
- d. Did anyone ever ask your opinion about whether or not the UG rescue operation should continue? If so, who?
it was doing it that
- when came out of mine, always on their own, they went to CC to tell them what they saw - no one told them to go thru, - would tell people in CC, Stables, Stables, Dave not always there*

108. When and why did you install the convergence stations?
decide to be left, don't know
109. How did you decide on the locations?
110. How often did you take readings?
111. What did the readings reveal?
 a. What good did the convergence stations do?
112. Was there any correlation between the bumps reported and convergence?

Continued to bounce due to slight resetting of stress/pressure

he says at the 7th it wasn't as bad as it was on 7th

Something material causes the slight redistribution or it could be our border could be

Company lacked Utah University seismic records

113. Were the readings routinely passed on to the command center? The company?

BLM Contacts and Reports

114. When did you first contact BLM? *Morning of 8/15 in Salt Lake City*
Hobbs, who directs BLM in that area,

115. Did you meet someone in Price? When? ←

116. How did this come about? *was told Hobbs would have info on mine, it's at a @ mine*

117. What information did you obtain? (Reports, geologic logs) (Did they get more than the four reports that we have? Link to BLM reports 1/24/05; 3/05/07; 7/12/07; 8/13/07) *in fo. on mine, Hank @ mine*

118. Did you follow-up with a meeting in Salt Lake City?

119. What did you learn from this?

Ground Control Experts

120. Who suggested that the panel of ground control experts be convened? *was it there @ time but Joe Z + Joe C*

121. When was this? *8/16*

122. Was consulting outside experts considered earlier than this date? *this is only consultation that we can recall*
a. If so, when?
b. Why were they not consulted before the August 16 accident?

123. Who had input into the selection of the experts? (Was the company involved in the selection process?) *Don't know why*
He wasn't there; RLD did, company did

124. When did the experts get on site? *not when they 1st arrived*

125. Did the expert committee travel underground? (Why not?) *Don't believe they did*

126. Who briefed them? *He don't know*

127. What did the panel conclude? Was a formal statement issued?

lead to a statement they put out

Didn't know about Howie Falk's reports @ this time

128. How well do you know Billy Owens? *has worked with him*
- a. Do you know what his background concerning bounces?
129. What do you think about Billy Owens experience in ground control?
130. Why was Billy not brought to the mine site during the rescue? *Don't know why*
- a. Did you ever consult with Billy during the rescue operation about what his opinions would be? *He was at*
- i. Why or why not? If yes, what did he recommend? *Gregg*
131. In your opinion, has D9 ever made a concerted effort to prevent or reduce bounces? *they have tried to do mine design to help*
- a. What are they?
- b. Have they ever contacted TS for help concerning preventing or reducing bounces? *Not as a special initiative individual mines, project by project basis*
- c. What do you feel about the use of shielding and body armor for protection from bounces as opposed to preventing or reducing bounces? *I think it is good policy - any protection is appropriate should not be used in lieu of proper mine design*

Investigation Team's UG Visit to Crandall Canyon

132. Who made the decision for the Accident Investigation Team to revisit the scene of the August 16th bump? *group decision - temporary surveillance camera station, 24 to 50"*
133. When did you do this? *Sept 10, Sept 12*
134. How far inby were you able to travel? *accident site*
135. Did representatives of the Company or the miners accompany you? *no one but AIT team*
136. How was it determined that it was safe for the team to do this? *measured cycloidal flow*

Additional Questions

137. The Roof Control Division tracking sheets show that Bill Knepp requested Technical Support assistance for the Aberdeen Mine in May 2007. ([link to tracking sheet](#)) Were you aware of this request when it was first made?

Don't recall anything other than that it was done

138. Do you have any knowledge of a request for assistance for the Crandall Canyon Mine being made at the same time as this request?

Not aware of any

139. Is there anything else you would like to tell us that we may not have asked you?

This is all the questions we have for you at this time. We may have more questions in the future. If so, we will contact you and set up a follow up interview. If at a later time you think of something additional you would like to tell us or think we should be aware of, please let us know.

Would you agree to not discuss this interview with anyone else in order that we may obtain unbiased information from future interviewees?

Thank you.

Joe P

Questions for Mike Gauna

The Secretary has assigned this group the task of evaluating MSHA's performance during the period preceding the August 6, 2007 coal bounce at the Crandall Canyon Mine and the subsequent rescue effort. We will also be evaluating issues that were raised during this time period regarding Bob Murray and his interaction with MSHA. This is not an investigation or review of any individual person. It is an administrative review of MSHA's actions as an agency. This evaluation will be presented to the Secretary in the near future, and it is intended that the results of the evaluation will be made public. This interview is being conducted to gather information for this assignment. We also intend to interview a number of other MSHA employees. So that we may obtain unbiased information from all persons to be interviewed, we ask that you not discuss this interview with anyone until all of the interviews have been completed.

[For non-management interviewees: You may have a union representative present if you wish, and may consult with him or her at any time.]

Background/Experience

1. Please state your full name.
2. What is your current position in Technical Support? How long have you worked in this position? *Rescue Specialist TS*
APRIL 2000 *CONSOL* *3 YRS*
3. Briefly describe your work experience before this position.
Kennecott, JWR, ISLAND CREEK, *ISLAND CREEK*
RI 9325
4. Can you tell us about your experience with dealing with bumps?
 - a. Previous investigations conducted, publications authored, etc?
 - b. Have you ever presented training on bumps to industry or MSHA personnel?
MANALAPAN RIVER COAL
5. What experience have you had in District 9 with evaluating or investigating bumps? *2 ENTRY PETTICOAT SKINOR DOGOUT*
 - i. Have you ever made any recommendations to D9 in regard to preventing or minimizing bumps?
LOOKED AT BUMP HISTORY
 - ii. If yes, what were they?
see other D9 experience
6. What is your definition of a bounce/bump? *explosion*
 - a. Outburst/burst?
violent explosion of material *HIGH STRESS*
 - b. When would a bump or bounce become immediately reportable to MSHA?
outburst or gas, etc
GAS Pressure is a factor

7. Can you tell us about your training in using ARMPS and/or LAMODEL?
NIOSH some training likes LAMODEL 2 D not 3D
8. Can you tell us about your experience in using ARMPS and LAMODEL specifically for evaluating bump potential applications?

Neither system does good in evaluating bump conditions

Response to the August 6th Event

9. When did you first become aware of the August 6 incident?
midday August 6 late on 6th - first vent people were going
10. Was it immediately clear that it was a bump event and that you were being assigned to respond? If not, explain.
and he thought it was an explosion
11. How quickly were you able to respond?
no specifics just see what happened
12. When did you arrive at the mine site?
left on morning of 7th got there on afternoon of 7th
13. Whom did you report to when you arrived at the mine?
reported to command center
14. Was the MSHA organizational structure clear to you?
Blue goose very manned
- a. Who was in charge when you arrived at the mine?
Bill Taylor at Dawson Project
- b. Did this change when HQ personnel arrived?
inher perspective - everything was directed by who was in Blue Goose
15. What instructions were you given? By whom?
sometimes at Dawson gave instruction
16. Who did you interact with from the company?
Stuckler did ask questions
17. How did this working arrangement with the company come about?
18. Under this arrangement were you able to obtain the necessary technical information that you felt you needed? (maps, geologic information, etc)
19. Were you ever consulted on the plans the operator was submitting for the underground rescue operations?
first plan consulted on near 11th
- a. What was your involvement in the plan approval process?
20. On August 7th you went underground with Gary Jensen for an initial assessment of the area. What were your first thoughts of what you observed?

*Go v6 1 min. & evaluate conditions
 5:30 on 7th*

lots of activity happening in #4 mls 119

stresses started at 117 material in water

no one from company on initial visit

*BRIEFED ? on first DAY
 no Briefing on surface
 but Gary gave brief U.G.
 Got a map*

*later saw Lane Aldan and felt he had a good sense of bump in the west
 after got outside got formal briefing from Aldair
 got better history later*

21. According to Joe Zelanko's notes, on Wednesday August 8th, you and Joe reviewed the proposed mining plan for the rescue effort. What did this review consist of?
22. Based on this initial review, did you recommend any changes?
23. How did the decision to use a Lexan shield for the CM operator come about?
24. Was there also any consideration given to providing the shuttle car operators with additional protection?
25. What did you do on August 8th as far as running ARMPS and LAMODEL?
26. What was your goal with these efforts?
27. Were you successful in getting useful output?
28. Who did you discuss this information with? (From MSHA, and the Company both)
29. Did you make any recommendations based on these models?
 - a. To whom?
 - b. Did they consider your recommendations?
30. Did you continue to run additional ARMPS and LAMODEL runs?
31. What input parameters were you changing compared to the initial runs?
32. Did your results alter your thoughts on the rescue effort in any way?
33. Were the decision makers for MSHA available for you to consult with?
 - a. Did they ever ask you for input or about your concerns? *they did have access to top people*
34. Did you ever feel that the MSHA decision makers were relying on TS to determine if it got too dangerous to continue with the underground operation?
 - a. Did you feel pressure as being responsible for whether the rescue operation should have continued or not? *relying on each other*
 - b. Is it normally the function of TS to make these decisions in an operation of this type? *relied on team advice*
 - c. Would the function of TS normally be as advisors to the persons in command, or to be decision makers?

no previous training, first experience in mine emergency

35. What did you really feel your role in this operation was? Why? *AS needed Basis*
more of an advisor He was not the person to make the
36. With the magnitude of the bounce that occurred and 7% oxygen readings *Stop decision*
from the # 1 borehole, did you feel there was still a chance of survival of the 6 missing miners?
- When did you decide there was no chance of survival?
 - Was this ever discussed with the decision making personnel from MSHA?
 - What discussions were held about the survival of the missing miners? When?
 - Were any MSHA personnel outside the decision makers ever asked if they thought the missing miners survived the original bump? Why not?
37. Did you go underground?
- If yes, what did you think of UG environment where the material was being loaded? *yes*
 - Did you feel the plans were being carried out as approved?
 - With what you saw, what did you feel about the chance of the missing miners surviving?
38. Were you underground when any bounces occurred? If so, please describe it. *No*
- If not, how were you getting information from the underground operations concerning when bounces occurred?
39. Have you ever been in a mine when a bounce occurred? Describe. *No*
- Have you ever seen a bounce as extensive as the August 6 bounce?
 - Have you ever known of anyone cleaning up material expelled due to a bounce where the entries were almost filled with material? Describe.
 - How could any experience with previous bounces be applicable to this in advancing an entry in this area?
40. What did you think of the barrier and roof moving into the # 1 entry and shearing off the roof bolts?
- Can you describe to us how this occurred?
 - What did you think would be the effects of cutting 10 more feet of the barrier as advancement was made in the entry?
41. Were you ever asked to go underground to evaluate safety concerns of the inspectors?

*correlation
of loading
material in # 4
and heavy bounce
and loading material
in # 1 and
bounces*

- a. If so, what did you do?
 - b. What were the results or any recommendations?
42. Were you aware of any concerns of any rescue workers about the safety of continuing with the underground rescue operations?
- a. If so, who had the concerns?
 - b. What were the concerns?
 - c. What was done about them?
43. Were you aware that any company workers asked to be removed from the recovery area?
- a. If so, did you talk with them or assign anyone to talk to them as to why they elected to be withdrawn from the underground operation?
 - b. If yes, what were their concerns?
 - c. Did you do anything to address their concerns?
 - d. If not, why?

Request for Keith Heasley to Model

44. Was it your decision to contact Keith Heasley about doing some modeling? *talked to Strickler if would allow help even on site if necessary. He said got anyone you need.*
45. Did you consult with anyone prior to contacting Keith? Who?
46. When did you first contact him? *(link to e-mail)*
on the 11/11 emailed him files
47. What did you do to assist him with the modeling?
wanted him to do a model
48. When did you get feedback from Keith?
no thoughts about him coming on site
49. Describe Keith's results.
50. Did his results alter your thinking about any aspect of the rescue effort?
51. Has Keith or any other expert been contracted as part of the official investigative effort? Please explain.

Support Plan

52. According to Joe Zelanko's notes, on August 8th, you and Joe also provided an opinion of the standing support? What did this consist of?
53. Were the Rocprops considered at this time (instead of posts)? Explain.
54. What experience do you have with Rocprops?
55. When did the Rocprops become part of the support plan?
56. Were these 40 ton Rocprops?
- a. Were they subsequently increased to 50 ton props?
 - b. Who recommended this change and why?
57. Did you consult NIOSH (Tom Barczk) about the standing support aspect of the support plan?
- a. If so, what were his recommendations?
58. Did you solicit any input from local personnel (either MSHA inspectors or company personnel), or did they ever offer input, on the use of Rocprops?
- a. If so, what did this consist of?
59. Did anyone ever inform you that Rocprops had been blown out in bumps at other mines?
- a. If you had known this, how would it have affected your decision to use them?
60. Were you aware of Rocprops becoming dislodged due to shuttle cars bumping them? Did this concern you in any way?
61. Are you aware of any problems with the Rocprops being installed in a tilted manner?
- a. Did you ever see any that appeared to have been kicked out or moved at the bottom?
 - i. Did you feel they were installed incorrectly?
62. How were the wire ropes being secured on the last prop?
- a. Was this an effective method to insure that the ropes would hold the props in place?
 - b. Were any other methods of securing the wire rope considered?
 - i. If yes, what were the ways?
 - ii. Why were they not attempted?

Never
Saw
any
Plans
until
shown
here

BRIEFINGS & DeBRIEFINGS

63. In your opinion, was the material in the # 1 entry serving as support for the barrier and adjacent pillars?
- What was the effect of removing the material?
64. What set pressure was used for the Rocprops— how was this arrived at?
- How was it assured that the correct pressure was applied?
65. Were the Rocprops color-coded based on height? Explain.
- Was there ever a concern about the recommended set height being exceeded?
66. Was there an attempt to calculate a lateral load capacity of the Rocprops at this set pressure?
- If so, how was it done? *No Not being done*
 - What was the result?
67. Would Rocprops not be more designed for vertical support instead of lateral support?
- Why were they considered as support for lateral forces?
68. Do you feel the Rocprops were doing anything to actively prevent a bounce?
- If yes, what?
 - If no, what was their purpose?
 - If the props were just being used to protect people from material from the ribs, do you think the props would have held the material expelled in the # 4 entry from the bounce on August 7?
69. Did you or Joe Zelanko discuss with Peter Saint the possible use of a bracket for the Rocprops designed to better resist lateral loading?
(pictures)
- Did you (or anyone else) investigate this bracket further?
 - If not, why not? (What factors did you consider in this decision?)
70. Did you or anyone have contact with the San Juan mine where the bracket props were developed and used?
- Did they offer any assistance?
71. What was used in conjunction with the Rocprops (top and bottom of jacks)?
- Were there concerns about the wood yielding after the initial set?

72. Can you tell us what you know of any other support methods that were considered? (tunnel liners, arches, etc)
73. Was the support plan re-evaluated at any point in time as the rescue/recovery effort continued?

Review of Agapito reports

74. When did you first become aware of the Agapito reports?

75. What reports were these? (Dates)

ones that Billy Owens ~~said~~ sent

76. Upon learning of the reports, when did you request and receive them?

77. What was your initial opinion?

78. What did you do to analyze these reports? (Did you attempt to run ARMPS and/or LAMODEL?)

79. What did your analysis of the Agapito evaluation reveal?

80. What do you think of Agapito's use of the following that they used in their original analysis?

- a. Coal strength
- b. Elastic modulus of coal
- c. Mine geometry
 - i. How they handled the bleeder pillar in their evaluation?
- d. LAMODEL yielding zones
 - i. In the Jul 20th report do you feel that this cross section is realistic – the fact that it shows such high stress levels dissipating in such a short distance and not loading up the adjacent pillars?
- e. Stability factor calibrated for mine appears to be where the mine had trouble.

81. Are you aware of the NIOSH work in 2002 to update the initial ARMPS software with more case studies of mines with deeper overburden?

- a. Specifically, have you reviewed the NIOSH paper entitled "Deep Cover Pillar Extraction In The US Coalfields"?
- b. One aspect of this paper emphasizes the importance of barrier pillars to prevent bumps. The paper concludes that for the NIOSH

July 20, 06
Apr 18, 07

database of case histories, when a Barrier Pillar Stability Factor of 1.9 was achieved, no bumps occurred. Are you aware that this information is discussed and available in the ARMPS help files?

- c. In light of this, were you surprised that the BPSF was not analyzed for Crandall Canyon as part of the District 9 ARMPS evaluation?
82. When did you first become aware of the March 11, 2007 bump in the North Barrier?
 83. Considering the circumstances of the March 11th bump (retreat mining under an area of 2000 ft of cover) and the fact that the upcoming mining in the South Barrier would essentially duplicate this scenario, should the plan to mine the South Barrier been approved?
 84. Did anybody discuss the March bump with you while you were at Crandall Canyon?
 - a. If so, please explain.
 85. At the time you first heard of this bump did you consider it reportable under Part 50? If not, why not?
 86. When did you first become aware of the April 18, 2007 Agapito report discussing the March 2007 bump?
 - a. Are you aware of the statement in this Agapito report that discusses the March 2007 bump in the North Barrier retreat section, (highlighted here) describing it like this: *"A large bump occurred at this point resulting in heavy damage to the entries located between XCs 133 and 139? The remaining north panel was abandoned in favor of mining the south barrier."*
 - b. Based on this description of the March bump, do you believe that retreat mining in the North Barrier was stopped simply because of bleeder entry stability?
 - c. In light of this description, should an ARMPS or LAMODEL analysis be re-ran at this time using the North Barrier as historical mine data?
 87. Were you aware of the pictures taken by mine management during Agapito's March 16, 2007 visit to the bump area? (*refer to photos*)
 88. If you had investigated the March bump and saw damage such as is shown in these photos, would you have considered this as a failure in the ARMPS "groundproofing" scheme of things? (Essentially would you have considered this a new "failure" point in the ARMPS database – at the

ARMPS SF of .53 – thus calling into question the validity of the Agapito claim that the 1st North historical analysis was valid?)

- a. Would you have then asked the mine for additional justification to retreat mine in the South?

89. The roof control plan amendment submitted on May 16, 2007, and approved June 15, 2007, for the South Barrier states: *“Consultant reports indicate the development will avoid the majority of the side abutment stress transferred from the adjacent longwall panels. These assessments have been validated by conditions experienced in the mine.”* This amendment was submitted after the bounce in the North Barrier caused mining to cease there.

- a. In your opinion, how did the operator justify this statement in light of the bounce in the North Barrier?
- b. Based on available information, should the plan to retreat in the South Barrier have been approved?

90. The roof control plan addendum approved March 8, 2007 specified the same pillar size as the Nov. 21, 2006 plan addendum (80' by 90'). After the March 10, 2007 bump in the North barrier, Agapito recommended by letter dated April 18, 2007 that the crosscut centers be increased to 129' in the south barrier.

- a. Also Agapito had stated in their July 20, 2006 report that increasing crosscut spacing is not expected to significantly improve ground conditions, then in April 18, 2007 after evaluating the bump in the North barrier, they stated that the additional 37 foot pillar length would increase the coal strength of the pillars' confined cores which helps to isolate bumps to the face and reduce the risk of larger bumps overrunning crews in outby locations.
- b. What is your opinion of this apparent contradiction and oversight?

91. When comparing this roof control plan amendment with this ventilation plan amendment, they appear to conflict in allowing the operator to extract the three pillars between the # 1 and # 2 entries in by cross-cut 139. What is your opinion of this?

92. Also in regard to leaving the additional pillars from x-cut 139 to 142, this would appear to be in conflict with the April 18, 2007 Agapito report which cautions: *“Skipping pillars should be avoided in the south barrier, particularly under the deepest cover.”* Would this concern you?

- a. Should an ARMPS or LAMODEL evaluation have been conducted taking the skipped pillars into account? In your opinion, what would it have shown?

93. What was your first thought when you saw the map showing the barrier pillars being mined at Crandall Canyon?
- Are you familiar with any other mines that have or are mining barrier pillars in similar depths of cover?
 - What is your opinion of it?
94. What is your interpretation of mining bottom coal?
95. Were you aware that bottom coal was being mined at Crandall Canyon?
- Would the increased mining height have affected the stability of the barrier and pillars?
96. Did any of the ARMPS analyses conducted by the District or Agapito consider a mined height greater than 8 feet?
97. Did any of Agapito's LAMODEL analyses consider a mined height greater than 8 feet?
98. Have you obtained other Agapito reports as part of the investigation?
- What have these reports revealed?

Aberdeen Mine

99. What type of work has TS done at the Aberdeen mine?
100. Did you or other Roof Control Division personnel visit the Aberdeen mine with Billy Owens on May 23, 2007?
- Why?
 - What were the results of this visit?

Use of Seismic Data

101. When did you first contact the University of Utah concerning the seismic data?
102. Did you consider contacting them at any time prior to this?
103. Was using the seismic data considered as a way to analyze the frequency and severity of bumps during the rescue operation? (As a predictive tool)

104. What was the thought process concerning the seismic data?
105. Why contact them on August 29th?
106. Did you see or analyze seismic logs relating to bumping underground during the rescue operation? (*Show bump activity log*)
- Were you aware of the bounce that occurred on the early morning hours of August 7?
 - If so, what was your opinion of this?
 - Did removing the material in the # 4 entry have any effect on causing this bounce?
 - Would removing the material in the # 1 entry not cause the same effect?
107. Did you analyze frequency of bumps or severity of bumps from reports of the underground crews and the logs?
- If not, was anyone assigned anyone to evaluate the frequency and severity of bumps that were occurring?
 - Did this analysis give you any reservations about continuing with the rescue operation because of the frequency or severity of the bumps?
 - Did you or anyone else suggest stopping the rescue operation because of the recurring bumps? If so, to whom?
 - Did anyone ever ask your opinion about whether or not the UG rescue operation should continue? If so, who?

Convergence Stations

108. When and why did you install the convergence stations?
109. How did you decide on the locations?
110. How often did you take readings?
111. What did the readings reveal?
- What good did the convergence stations do?
112. Was there any correlation between the bumps reported and convergence?

113. Were the readings routinely passed on to the command center? The company?

BLM Contacts and Reports

114. When did you first contact BLM?

115. Did you meet someone in Price? When?

116. How did this come about?

117. What information did you obtain? (*Reports, geologic logs*) (*Did they get more than the four reports that we have? [Link to BLM reports](#) 1/24/05; 3/05/07; 7/12/07; 8/13/07*)

118. Did you follow-up with a meeting in Salt Lake City?

119. What did you learn from this?

Ground Control Experts

120. Who suggested that the panel of ground control experts be convened?

121. When was this?

122. Was consulting outside experts considered earlier than this date?

a. If so, when?

b. Why were they not consulted before the August 16 accident?

123. Who had input into the selection of the experts? (Was the company involved in the selection process?)

124. When did the experts get on site?

125. Did the expert committee travel underground? (Why not?)

126. Who briefed them?

127. What did the panel conclude? Was a formal statement issued?

128. How well do you know Billy Owens?
 - a. Do you know what his background concerning bounces?
129. What do you think about Billy Owens experience in ground control?
130. Why was Billy not brought to the mine site during the rescue?
 - a. Did you ever consult with Billy during the rescue operation about what his opinions would be?
 - i. Why or why not? If yes, what did he recommend?
131. In your opinion, has D9 ever made a concerted effort to prevent or reduce bounces?
 - a. What are they?
 - b. Have they ever contacted TS for help concerning preventing or reducing bounces?
 - c. What do you feel about the use of shielding and body armor for protection from bounces as opposed to preventing or reducing bounces?

Investigation Team's UG Visit to Crandall Canyon

132. Who made the decision for the Accident Investigation Team to revisit the scene of the August 16th bump?
133. When did you do this?
134. How far inby were you able to travel?
135. Did representatives of the Company or the miners accompany you?
136. How was it determined that it was safe for the team to do this?

Additional Questions

137. The Roof Control Division tracking sheets show that Bill Knepp requested Technical Support assistance for the Aberdeen Mine in May 2007. ([link to tracking sheet](#)) Were you aware of this request when it was first made?
138. Do you have any knowledge of a request for assistance for the Crandall Canyon Mine being made at the same time as this request?
139. Is there anything else you would like to tell us that we may not have asked you?

This is all the questions we have for you at this time. We may have more questions in the future. If so, we will contact you and set up a follow up interview. If at a later time you think of something additional you would like to tell us or think we should be aware of, please let us know.

Would you agree to not discuss this interview with anyone else in order that we may obtain unbiased information from future interviewees?

Thank you.

MURRAY

BRIEFINGS - JE BRIEFINGS

SAFE ON 16TH
UNSAFE ON 17TH

EXCURSION
OVER
MATERIAL

Opinion on how far material went