2011

NATIONAL MINE RESCUE COMPETITION

Day 2 Contest Problem

Greater Columbus Convention Center
October 3 - 6, 2011
Hello, I am __________, Superintendent of the Cat’s Paw Coal Co., Buckeye No. 1 Mine. I thank you for your quick response.

Last night three repairmen, an examiner, and a foreman went to the 1 ½ Right off 2 South Mains Section to repair equipment and finish the weekly examination.

Near the end of the shift, the foreman called outside and said they smelled smoke. The responsible person walked outside his office to see if there was anything burning outside.

Shortly thereafter he heard a blast and saw smoke and flames come out of two of the three drift openings.

He ran back inside the office and called underground but no one has answered the phone.

The blowing mine fan is off but is operable. The fan can be started, stopped, or reversed if needed. The fan is in the No. 1 drift opening and is being guarded.

All electrical circuits going underground have been locked-out and are guarded.

All authorities have been notified.

You are located in the Fresh Air Base. There is a safe haven for the briefing officer in the fresh air base. All outby areas have been explored. The mine map is up-to-date.

There is a trained mine rescue team here as a back-up.

We have a trained life line judge. (Introduce the lifeline judge).

All face-down placards will be turned over by the captain prior to he/she passing the placard.

As you explore, the captain must turn over every face-down placard before he/she passes that placard.

(Introduce the field judges)

Good Luck!
2011
NATIONAL MINE RESCUE CONTEST
DAY 2 PROBLEM

EXPLORE ALL OF THE MINE THAT CAN BE DONE SAFELY.

ACCOUNT FOR ALL MISSING PERSONS.

BRING SURVIVORS TO THE FRESH AIR BASE.

CALL OUT THE LOWEST O2 READINGS TO BRIEFING OFFICER WITH 20 MINUTE CHECKS.

TEAM CAN ONLY CARRY THREE SETS OF BUILDING MATERIAL AT A TIME.

YOU WILL HAVE 70 MINUTES TO COMPLETE THE PROBLEM. AT THAT TIME YOU WILL BE REPLACED BY ANOTHER TEAM.
Note at Team Stop 1

“The barometer has started to fall and the low oxygen has migrated from the seal toward the hardened room.

I have closed the door. I am safe and have good air from the borehole. Please continue to explore.”
Note for Patient Behind Barricade in No. 1 Heading:

“HELP, HELP, GET ME OUT OF HERE!!!”
I CANNOT OPEN THE DOOR. YOU WILL HAVE TO CHECK OUTSIDE MY LOCATION BEFORE I CAN OPEN IT.
Note when Team Exits Mine at End of Problem

“The barometric pressure has increased and the irrespirable gas has retreated to the seal.”
GAS TESTS, R&R, D&I, TEAM STOPS

1. LUNCH BOX
   - 2 PPM CO
   - 7.0% CH4
   - 19.6% O2

2. SCOOPE BATTERY

3. BOREHOLE TO SURFACE
   - FOUR TIMBERS

4. WATER OVER KNEE DEEP
   - PERSON / BODY
   - HAMMER

5. BATTERY RAMCAR
   - 8 PPM CO
   - 5.4% CH4
   - 19.6% O2

6. WATER OVER KNEE DEEP
   - BOW SAW

7. SANDWICH WRAPPER
   - 5 PPM CO
   - 4.4% CH4
   - 19.0% O2

8. UNCONSCIOUS LIVE PERSON
   - 4 PPM CO
   - 4.0% CH4
   - 19.0% O2

9. 5 PPM CO
   - 6.4% CH4
   - 19.0% O2

10. 8 PPM CO
    - 5.4% CH4
    - 19.6% O2

11. 7 PPM CO
    - 5.4% CH4
    - 19.6% O2

12. 6 FOOT SHAFT

HARDENED ROOM AND BRIEFING OFFICER'S STATION

LIVE CONSCIOUS PERSON

FIVE ROOF BOLTS

PALLEY OF GLUE

5 PPM CO
6.4% CH4
19.0% O2

SCOOPE BATTERY

HAMMER

BATTERY

Caved Air Tight

2 PPM CO
- 4.4% CH4
- 19.0% O2

2 PPM CO
- 4.0% CH4
- 19.0% O2

2 PPM CO
- 7.0% CH4
- 19.6% O2

2 PPM CO
- 5.4% CH4
- 19.6% O2

2 PPM CO
- 7.0% CH4
- 19.6% O2

2 PPM CO
- 0.3% CH4
- 17.5% O2
FAN (AS LEFT) (CIRCLE ONE):

- BLOWING
- EXHAUST

NOTE:
- MARK VENTILATION CONTROLS AS LEFT IN THE MINE

BATTERY RAMCAR

2 PPM CO
4.0% CH4
19.2% O2

4 PPM CO
4.0% CH4
19.0% O2

JUDGE'S MAP

LIVE CONSCIOUS PERSON

3 TIMBERS

UNCONSCIOUS LIVE PERSON

6 FOOT SHAFT

WATER OVER KNEE DEEP

2 PPM CO
4.4% CH4
19.1% O2

2 PPM CO
4.4% CH4
19.0% O2

2 PPM CO
4.0% CH4
19.2% O2

8 PPM CO
5.4% CH4
19.6% O2

7 PPM CO
5.4% CH4
19.6% O2

5 PPM CO
5.9% CH4
19.2% O2

5 PPM CO
4.4% CH4
19.0% O2

5 PPM CO
4.8% CH4
19.6% O2

8 PPM CO
5.9% CH4
19.6% O2

PERSON BODY

LUNCH BOX

SCOOPE

BOREHOLE TO SURFACE

HARDENED ROOM AND BRIEFING OFFICER'S STATION

FOUR TIMBERS

Caved Air Tight

2 PPM CO
7.0% CH4
19.6% O2

2 PPM CO
6.4% CH4
19.0% O2

2 PPM CO
7.0% CH4
19.6% O2

2 PPM CO
6.4% CH4
19.0% O2

2 PPM CO
5.4% CH4
19.6% O2

2 PPM CO
4.0% CH4
19.2% O2

2 PPM CO
5.9% CH4
19.2% O2

2 PPM CO
4.4% CH4
19.1% O2

2 PPM CO
4.4% CH4
19.0% O2

7 PPM CO
5.4% CH4
19.6% O2

8 PPM CO
5.4% CH4
19.6% O2

2 PPM CO
4.4% CH4
19.0% O2

8 PPM CO
5.4% CH4
19.6% O2

2 PPM CO
4.4% CH4
19.0% O2

6 FOOT SHAFT

6 FOOT SHAFT
2011
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DAY 2 JUDGE’S INSTRUCTIONS

Note: The captain must turn over all face-down placards before he/she passes them. Discount the team 2 points under Rule 50 for each placard not turned over as described.

FRESH AIR BASE

Team will prepare equipment, check stretcher(s) and gas detectors. Captain will D&I date-board after starting clock.
Team will check all three openings, with Gas Test s in the No. 1 entry and at each temporary stopping in Nos. 2 & 3 entries.
Team will find scoop batteries in the openings of Nos. 2 and 3 entries.
Fan is OFF
Captain will D&I temporary stoppings in Nos. 2 & 3 entries.
Team will find four timbers in No. 3 entry.
Team will travel to the No. 1 entry.
Captain will R&R test unsafe roof.
Captain will D&I outby side unsafe roof.

TEAM STOP 1
Team will take timbers from the No. 3 entry to the No. 1 entry.
Team will set timbers through the unsafe roof.
R&R test inby side of loose roof.
Team will travel to the intersection.
Gas Test all openings.

Team will find Irrespirable Mixture inby intersection up to Caved Area.
Team may pick up Brattice Cloth.
Team will make 50 ft. apparatus check. Team will call out lowest O2 reading.

Team will check lunch box.
At this team stop, the Superintendent will give a note to the Briefing Officer that states, “The barometer has started to fall and the low oxygen has migrated from the seal toward the hardened room. I have closed the door. I am safe and have good air from the borehole. Please continue to explore.”

TEAM STOP 2

Team will travel across to the No. 2 entry in the first crosscut.

Team will Gas Test all openings.  
Captain will examine back to the temporary stopping.  
Captain will D&I stopping.  
Gas Test at stopping.

Water over knee deep in No. 2 entry.  
D&I water.  
Team may pick up Brattice Cloth (2) and Line Curtain.

TEAM STOP 3

Team will travel to first intersection in No. 3 entry.  
Gas Test all openings.  

Gas Test and D&I at stopping.  
Find Explosive Mixture.  

Unsafe roof ahead in No. 3 entry.  
Roof Test at unsafe roof.  
Find Person (1st) placard.

TEAM STOP 4

Travel up the No. 3 entry, only one open.  
Travel into 2nd intersection No. 3 entry.  
Find Caved area in 2nd crosscut, 3 – 2.  
Captain will Roof & Rib Test and D&I the caved area.  
Gas Test all openings.  
Find Unsafe Brow Rib along right rib.
TEAM STOP 5
Team will travel to the 3rd intersection No. 3 entry
Team will find the Brattice Cloth.
Gas Test opening at intersection.
Captain will travel to the Caved Area inby in No. 3 entry. D&I, R&R at Caved Area.

TEAM STOP 6
Team will travel back across to the 3rd crosscut No. 2 entry.
Gas Test openings.
Find Unsafe Roof in crosscut 2 – 1.
D&I, R&R at Unsafe Roof.
Explosive Mixture found in No. 2 entry outby water.
Team will find Water Over Knee Deep in the No. 2 entry.
Captain will D&I at the water.
Find Brattice Cloth in the No. 2 entry.

TEAM STOP 7
Team will travel outby in the No. 2 entry to attempt to tie-across and behind to the contaminant in the No. 1 entry.
Gas Test all openings at No. 2 intersection.
Irrespirable Gas found in 2nd intersection.
Body (2nd) found in No. 2 entry.
Captain will D&I body.
Back side of Water Over Knee Deep.
Captain will D&I water.
D&I, R&R at Caved Area between 2 – 3.

TEAM STOP 8
Team will travel to the No. 1 entry, 2nd crosscut.
Caved area outby across No. 1 entry
Captain will R&R Test and D&I the caved area.
Gas Test the openings.
TEAM STOP 9

Team will travel up the No.1 entry to the 3rd intersection.
Gas Test at openings.
Irrespirable Gas in 3rd crosscut, 1 – 2.
Captain will find other side of unsafe roof.
R&R Test and D&I unsafe roof.
Will find Body (3rd) in the No. 1 entry.
Captain will D&I at the body.

TEAM STOP 10

Team will travel up No. 1 entry to LOCC.
Gas Test opening.
Team will find Barricade inby in the No. 1 entry.
Captain will D&I the barricade.
Gas Test at barricade.
Team will find Irrespirable/Explosive Gas from LOCC to barricade.
Response from the barricade when team enters intersection in front of barricade.
Team cannot ventilate, must continue to explore.

TEAM STOP 11

Team will continue across the LOCC to the No. 2 entry.
Gas Test opening to right and outby.
Will find inby side of Water Over Knee Deep.
D&I at water.

Will find Irrespirable Gas inby corner in No. 2 entry to Barricade.
D&I Barricade.
Gas Test at barricade.
No response from inside.

TEAM STOP 12

Team will continue across the LOCC to the No. 3 entry.
Gas Test opening outby.
Will find **Battery Ramcar** (cannot be moved) and **Explosive Mixture** in crosscut 2 – 3.
Will find **Clear Atmosphere** going into intersection.
Will find open **6 Foot Shaft**.

Team will travel to the face of the No. 3 entry.
**D&l, R&R test** and **Gas Test**.

**Explosive/Irrespirable Gas** at the **Barricade in No. 1** cannot be moved across the **Battery Ramcar** in the LOCC, or outby across the **Unsafe Roof** in No. 3 entry, where the **Person** was found.

### VENTILATION

**First Ventilation**

Team will need to remove the **explosive/respirable** mixture from the 1st intersection of the No. 2 entry.

**Builds**
Across Nos. 1 & 2 entries inby 1st crosscut.
Across 2nd, 3rd, and LOCC, 2 – 3.
Any four of these builds will suffice in directing the air from the shaft.

Team can turn fan on **Exhausting**.

The air will clear the explosive mixture from 1st intersection No. 2 entry.

**Second Ventilation**

Team can now ventilate the No. 2 barricade to continue to explore for timbers needed to ventilate the No. 1 barricade.

Team will need to clear the **Irrespirable Gas** from the **Barricade** in No. 2 and the **Explosive Mixture** from the **LOCC 2 – 3**.
The timbers are needed to access the person placard in the unsupported roof between crosscut 1 – 2 in the No. 3 entry as the contaminant outside the No. 1 barricade is irrespirable and explosive.

**Builds**
Across Nos. 1 & 2 entries inby 1\(^{st}\) crosscut.
Across 2\(^{nd}\) crosscut, 2 – 3.
Across No. 3 entry, 3\(^{rd}\) – 4\(^{th}\) crosscut.
Across No. 2 entry, 3\(^{rd}\) – 4\(^{th}\) crosscut.
Across 3\(^{rd}\) crosscut, 1 – 2.

Reverse the fan.
Turn the fan on **Blowing**.

Hold line curtain to within five feet of the barricade.

The air will clear the irrespirable mixtures from the barricade in No. 2 and LOCC, 2 – 3, out the fan shaft.

Team can now enter the **Barricade** in the **No. 2 entry**.
Captain will **Gas Test** immediately inside the barricade.
Captain will D&I patient.
Captain or Team member will check patient.
Captain will R&R, Gas Test and D&I the Face.
Team will put apparatus on patient, pick up the timers and travel to the FAB.

**Third Ventilation**

Team will **Re-enter** the mine and travel to the **Unsafe Roof** in the No. 3 entry.
Captain will **Set Timbers** to touch and **Identify Person** as a **Body**.
Captain will **D&I body**.

Team can now clear the **Explosive/Irrespirable Mixture** from the **Barricade in the No. 1 entry**.

Team will leave stoppings as installed for previous ventilation.
Hang line curtain to within 5 feet of the **Barricade**.

Turn fan on **Exhausting**.
Will clear the **explosive/respirable gas** from the **Barricade**.

Captain will **Gas Test** immediately inside the barricade.
Captain will D&I patient.
Captain or Team member will check patient.
Captain will R&R, Gas Test and D&I the Face

The patient can be taken to the FAB open-faced.

Note: The team cannot compare the Team Map with the BO Map after the 3\textsuperscript{rd} Vent was completed.

Upon arrival at the FAB the captain will be given note stating, **“The barometric pressure has increased and the irrespirable gas has retreated to the seal.”**

The problem is now complete and the captain can stop the clock.