

EMERGENCY SIMULATION GUIDELINE FOR UNDERGROUND MINES

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Emergency Simulation Guideline for Underground Mines

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Introduction

Definition of a Simulation

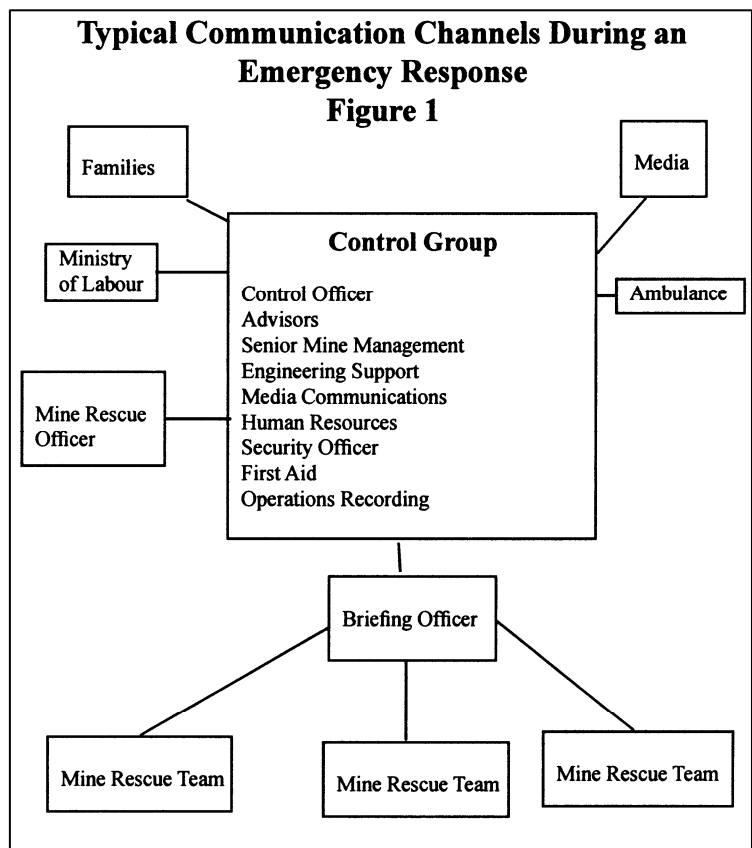
An emergency simulation is a controlled enactment of an emergency event that could occur at the worksite.

Purpose

A simulation is a way to test a company's emergency response plan. It allows the company to perfect the plan before an actual emergency occurs. The simulation may also point out hazards that can be controlled or eliminated to prevent an emergency from occurring. A company cannot conduct an effective emergency simulation unless an Emergency Response plan is in place. Emergency response plans can be lengthy documents that state who is to respond to an emergency and how. Plans often require response groups to complete specific and coordinated tasks that involve intricate levels of communication (see Figure 1). Reviewing written documents with workers and response teams is not enough to prepare for an emergency situation.

Benefits

Emergency simulations provide workers, management, and emergency response teams with sufficiently realistic opportunities to test and evaluate rescue skills, communication systems, and emergency procedures. Active participation of workers in emergency simulations helps reduce panic and increase communication levels, judgement and decision-making abilities. Well-run exercises will increase participants' retention of the emergency plan and increase overall performance in the event of an actual emergency.



Types of Simulations and Evaluations

Types of simulations and evaluations can vary based on the intended learning outcomes and the intended scale of the activity. However, all types of exercises have a common theme: to test the application of emergency response procedures for the individuals involved, including: miners, control groups, mine rescue teams, briefing officers and mine rescue officers.

Tabletop Simulations

A tabletop simulation is an informal, facilitated exercise that describes an emergency event in a narrative form. It provides an opportunity for a company to review the roles of departments and individuals and the actions they would take during an emergency event.

A realistic scenario is developed and following the directives of a company's emergency plan, all involved parties are invited to attend. In mining, tabletop simulations are ideal to test the roles and responsibilities of the emergency response control group. The simulation takes place in a single room with everyone gathered together. A facilitator presents the event to the group and then a discussion takes place as to how departments and individuals would respond to the given event.

Tabletop simulations generally last one to four hours, but time pressure is not part of the simulation. 'Injects' or further information should be provided throughout the simulation to allow the scenario to unfold as the group determine their actions and adjust their response.

Point-in-Time Evaluations

A point-in-time evaluation looks at the resources and personnel available to respond to an emergency at a given 'point-in-time'. It can be conducted by one or two people, the person responsible for emergency preparedness and the person responsible for calling mine rescue team members. A point-in-time evaluation does not need to involve any interruptions to the workforce. A point in time is selected and then the evaluation determines if the resources are in place to follow the emergency response plan. Point-in-time evaluations can test:

- If stench was injected at this point in time, where does the emergency plan require underground workers to report to?
- Are there mine rescue personnel who are not available due to vacation, illness or shift work?
- Are there enough trained people available to respond to this situation?

Point-in-time evaluations allow companies to make adjustments to the number of resources and trained workers available to ensure an adequate response in the event of an emergency. (See appendix for sample PIT evaluation.)

Functional Simulations

As opposed to tabletop simulations and point-in-time evaluations, where participants discuss the theory of the steps they will take, functional simulations require participants to complete the actions their emergency procedures require. A fire drill that requires people evacuating to a refuge station is a standard example of a functional simulation. The scenario can take place with groups located at different areas of the worksite, communicating by radio or phone or responding to an alarm system or stench gas.

Ideally, a functional simulation will take place in the same area that the given emergency would occur. It has a time component and requires a controller, participants and evaluators. A well-run functional simulation will determine strengths and weaknesses in established procedures, and test the readiness of people and equipment.

Full-Scale Simulations

Full-scale simulations are functional simulations on a much larger scale. They test the entire emergency plan. The simulations require participants to respond to a realistic simulated emergency often in a highly stressful environment. Completing the simulation involves the mobilization of equipment, personnel and resources.

Simulation - Set-up

Role of the facilitator

The success of the simulation is largely based on the approach of the facilitator. The facilitator can be from an outside organization but must have strong knowledge of the company's emergency response plan and procedures.

Previous experience in facilitating discussions would be an asset as it is crucial that the facilitator not actually participate in the scenario (by suggesting actions or recommending next steps) but still must remain responsible for:

- Setting up the scenario
- Providing participants with the necessary information for completing the scenario
- Monitoring the progress of the scenario
- Answering questions regarding rules (completion of tasks, phoning emergency contacts etc.) during the scenario, while not intruding on the process
- Conducting an after-action review

Schedules and Records

Schedules should be established to ensure everyone can participate in an appropriate number of simulations. Records should be kept to track types of simulations used, specific scenarios and lessons learned.

Learning Outcomes and Point of Termination

Before a scenario can be chosen, the facilitators must identify the intended learning outcomes of simulation. The outcomes must reflect the training and knowledge of the individuals participating in the simulation. Sample learning outcomes are provided below:

Sample Learning Outcomes

For Miners Underground:

Upon completion of the simulation, the participants will have demonstrated, in conjunction with the emergency plan, the ability to:

- Follow and complete evacuation procedures in a safe and efficient manner
- Effectively establish a refuge station as a safe location

For Mine Rescue Teams/Briefing Officer/Control Group:

Upon completion of the simulation, the participants will have demonstrated, in conjunction with the emergency plan, the ability to:

- Follow and complete briefing officer procedures (Mine Rescue)
- Locate and evacuate missing miners
- Verify transportation to medical centres is safe and efficient (remote locations)
- Control the emergency and re-establish normal operations

For Emergency Control Groups:

Upon completion of the simulation, the participants will have demonstrated, in conjunction with the emergency plan, the ability to:

- Initiate the mobilization response in a quick and efficient manner, including:
 - Complete and execute the initial actions required by the emergency plan
 - Form an effective emergency control group and control room
 - Establish a schedule for rotation of mine rescue teams
- Initiate and control the deployment response, including:
 - Create and issue clear and concise command post briefings
 - Create and issue clear and concise mine rescue team briefing and instructions

The point of termination is the pre-determined point when the scenario will end. It is closely tied to the learning outcome. It can be a set amount of time, as in the scenario will end at 3:00 pm or it can be when a set of actions is complete: all miners are safely located in refuge stations.

Determining a Scenario

The Ontario Fire Service uses the following six criteria to determine the validity of a scenario:

- Compliance with Standard – Does the simulation meet the intended learning outcome?
- Realism – Does the simulation provide a realistic event in which to test the learning outcome?
- Measurement Value – Does the simulation accurately measure the learning outcome?
- Safety – Can the simulation be conducted in a safe manner and meet the learning outcome?
- Time – Can the simulation be conducted in a reasonable amount of time and meet the learning outcome?
- Economy – Can the simulation be conducted within the limits of the worksite’s economic resources and meet the learning outcome?

Surprise Element

In general the more of a surprise the simulation is to the participants the more it will be able to accurately reflect the readiness of people and equipment. However if a company is starting to introduce simulations to its workforce, a sudden full-scale simulation may only serve to discourage participants and create a sense of unease about their roles. Valuable information can still be gained if participants know a tabletop simulation will take place at the end of the week, or a fire drill will happen sometime in the month. But as simulations are completed, the surprise element level should increase. When simulations reach the point that they are conducted with no warning, workers should still be aware that a simulation *could* take place at any moment.

Scenarios, especially full-scale, require a great deal of work in the set-up process. In order to keep the scenario a surprise, the company should limit the number of people involved in the set-up.

Frequency of Scenarios

Section 25(5) of Regulation 854 states that, at least once in every twelve months a fire alarm test of the procedures must take place during each production shift. This fire alarm test and evacuation would be considered a functional simulation.

The number of tabletop and full-scale simulation exercises that take place is at the mine’s discretion. Simulations undoubtedly improve a company’s response to emergency situations. In 1995, a lack of coordination and communication was cited in the emergency response of the bombing of a federal building in Oklahoma City. In order to avoid future confusion, the after-action review from the Oklahoma Department of Civil Emergency Management concluded:

“Planning, training and exercising are the only feasible recommendations if an integrated emergency management system is to be utilized and effective in future disasters...Effective coordination cannot be achieved during the chaos following any disaster. Relationships must be established, plans written and tested, and procedures agreed upon.”

Companies should conduct emergency simulations at a frequency that ensures the emergency response plan is well-thought out, effective and up-to-date, logical and emergency responders are capable of implementing and executing the plan in a highly stressful environment.

Operational Guidelines

Safety Considerations

The safety of all personnel involved with the simulation must be taken into account during the entire process. The simulation must operate in accordance with the laws of the Ontario Occupational Health and Safety Act, Regulation for Mines and Mining Plants (854) and the company’s own safety procedures and emergency mine plan.

Before the simulation begins, a method of terminating the simulation in the event of an actual emergency must be determined by the facilitator, along with a method for communicating it to all involved. Methods could include sounding an alarm system or a code word such as ‘freeze’ or ‘terminate’. Participants must have a clear understanding of what procedures to follow if the simulation is terminated.

In September of 2007, an at-sea training exercise by the Canadian Military and Coast Guard had to be called off immediately when 20 participants in a covered lifeboat were overcome by noxious fumes. The code word ‘no duff’ was repeated three times over radio to let everyone know the exercise had ended, and responders were now dealing with an actual emergency.

Scenario Briefing and Participant Instructions

At the beginning of the scenario the facilitator plays a strong role in setting the tone and expectations of the scenario. It is recommended the facilitator remind participants that in any simulation or actual emergency response:

- Emergency procedures should be followed in a calm and collected manner.
- Teamwork will be necessary and crucial to complete the actions required.
- Miscommunications are the most common cause of emergency response breakdowns. Time and effort must be taken to ensure communications are clear and concise and reach the required participants.

Participants must also know when a task or action is considered ‘complete’. Depending on the type of simulation (tabletop vs. functional or full-scale) participants will either declare or take actions. Tabletop simulations require participants to discuss their response to information and to inform the facilitator what actions they would take. In a functional or full-scale simulation, required actions must actually be carried out: if a victim’s arm is injured and needs to be immobilized, the participants will need to perform first aid and immobilize the arm. Similarly, if equipment is needed, participants will be required to physically obtain the equipment and bring it to the necessary staging area.

Once the rules and method to terminate the simulation are established, the facilitator can inform the group of the simulated emergency event that has taken place. Handouts can be given to describe the event or the participants may be responsible for recording information they receive from the facilitator.

Timing and Pace

The facilitator is also responsible for the timing and execution of the simulation. This is often controlled by how quickly information or ‘injects’ are made available to the participants. Facilitators should have a pre-determined schedule to release information.

Role Failure

Role failure occurs when a participant severely deviates from the emergency plan’s set protocols and procedures. Critical information that is not passed to the appropriate participants is an example of role failure and can render the simulation useless or too far off-base. Facilitators will have to decide whether to end the simulation or if there is anything to be gained by following a new direction. If role failure occurs, careful attention should be paid to why the failure occurred; did the participant have adequate training, or does the emergency plan require adjustment?

Props and Patients

Props and patients are used in full-scale and functional simulations to add realism to the event. For example, red lights can represent fire and for more elaborate simulations, smoke generators can be used. Workers can play the role of injured or missing miners, who can relay information regarding their injuries or the condition of the worksite to the participants.

Measuring Performance

Criteria for measuring performance must match the intended learning outcomes and correspond with the procedures required by the emergency plan.

Facilitator Observations

The facilitator's job is to accurately monitor, document and evaluate the actions taken by the participants. Documentation by the facilitator is critical particularly when preparing for debriefing meetings and writing a final report for filing. The facilitator (and possible additional evaluators) must be able to monitor several facets of the simulations. Depending on the type of simulation, this could include:

- Communication issues
- Failures to follow protocol
- Determining if the plan allows the control group to effectively oversee the management of an emergency situation
- Availability of team members and back-ups
- Gaps in the mine's emergency plan and procedures

Procedure checklist

Specific checklists that reflect required procedures can be developed for sections of the simulation. Checklists can track if a Briefing Officer has communicated the necessary information to a Mine Rescue team or if the proper sequence of events was followed in administering first aid. Checklists must be tailored to the simulation to measure performance effectively. Generic sample checklists are provided in the appendix.

Debriefing

Purpose

The post-simulation discussion or debriefing is the final step of the simulation and is critical to determining the effectiveness of the company's emergency response plan. The review should take place soon after the simulation. The facilitator needs to take sufficient time to gather all pertinent information including maps, notes, team captain's log, team captain's debriefing notes and assessing these against legislation, the mine's emergency plan, and best practices.

Facilitators should stress the purpose of the review is to gather information and improve the response plan, not to criticize or assign blame for decisions or actions. The debriefing allows participants to assess if they received information in a prompt and accurate manner, discuss any

equipment failures that occurred, and express any successes or frustrations they felt during the process. Information gathered from participants helps determine where breakdowns are likely to occur during an emergency and provides an opportunity for the problems to be resolved before an actual emergency.

Discussion Points

The Environmental Protection Agency uses the following discussion points for after-action reviews:

- Were the goals of the exercise achieved?
- Were emergency protocols and procedures followed?
- Did groups communicate well with each other?
- Was the chain-of-command adhered to throughout the response?
- Did the participants work as a team to resolve the situation?
- Were there training or staff deficiencies?
- Were resources sufficient to support procedures?
- Were there any 'lessons learned'?
- Can upgrades or corrections be made to the Emergency Response plan?

Review of Procedures

Evaluations should focus on whether actions taken by participants matched actions required by the emergency plan. Deviations from the emergency procedures should be examined to determine why they occurred (generally a flaw in training of the participant or a flaw within a procedure rendering the procedure impossible to follow).

Implementation of Changes

To gain value from the simulation, corrections and upgrades must then be made to the emergency plan and procedures in a timely manner. Participants should be informed of changes being made and the corresponding schedule. New simulations should not be conducted until participants have been trained in changes made to the emergency response plan.

Documentation and Record Keeping

Absolutely essential following the completion of a simulation is the creation of a final report that is kept on file for reference and to demonstrate the company's due diligence in preparing for mine emergencies.

Final reports contain the documents and record keeping that took place during the simulation, and the results and conclusions gained through the debriefing session. The report explains what the intended learning outcomes of the simulation were, the set-up of the simulation, how the exercise was completed, along with other findings, shortcoming and recommendations. (See sample in appendix.)

Final reports should be kept on file for a minimum of three years.

Appendix A: Preplanning Emergency Simulation Checklist

1.	Who needs to be notified in advance:	Senior Management	Y	N	N/A
		Safety Department	Y	N	N/A
		Mine Rescue Officer	Y	N	N/A
		No One	Y	N	N/A
		Other	Y	N	N/A
2.	What type of simulation will be used:	Tabletop	Y	N	N/A
		Functional	Y	N	N/A
		Full Scale	Y	N	N/A
3.	What is the simulation schedule:	Location	Y	N	N/A
		Date	Y	N	N/A
		Time	Y	N	N/A
4.	What scenario will be used:	Fire	Y	N	N/A
		Non-fire	Y	N	N/A
		Missing people	Y	N	N/A
		Other	Y	N	N/A
5.	What objectives have been identified for extra focus:	Securities	Y	N	N/A
		Cagetender	Y	N	N/A
		Hoistman	Y	N	N/A
		Mine Rescue	Y	N	N/A
		Control Group	Y	N	N/A
		Other	Y	N	N/A
6.	Has a risk assessment been completed:		Y	N	N/A
7.	Has the emergency plan been reviewed:		Y	N	N/A
8.	Has a list been prepared of all forms and checklists to be used:		Y	N	N/A
9.	Has confidentiality been maintained:		Y	N	N/A

Appendix B: Post Emergency Simulation Evaluation Checklist

1.	Did the fire warning system alert all workers:	Y	N	N/A
2.	Were all workers accounted for:	Y	N	N/A
3.	Did the following people respond promptly: Mine rescue team members Control group members Mine rescue officer Others	Y Y Y Y	N N N N	N/A N/A N/A N/A
4.	Was the control group adequately staffed:	Y	N	N/A
5.	Did the required number of mine rescue teams respond:	Y	N	N/A
6.	Did the hoistman/cagetender respond promptly:	Y	N	N/A
7.	Was the team briefing complete:	Y	N	N/A
8.	Did any emergency equipment fail:	Y	N	N/A
9.	Were all checklists/forms properly completed:	Y	N	N/A
10.	Was the emergency plan current and complete:	Y	N	N/A
11.	Was the notification plan followed:	Y	N	N/A

Appendix C: Post Emergency Simulation Checklist

1.	Were all forms and documentation collected and compared with list made in preplanning:	Y	N	N/A
2.	Evaluate forms and documents: All forms used	Y	N	N/A
	Filled out correctly	Y	N	N/A
	Filled out completely	Y	N	N/A
3.	Was debriefing scheduled: Who	Y	N	N/A
	Date	Y	N	N/A
	Time	Y	N	N/A
	Location	Y	N	N/A
4.	Were actions compared with emergency response plan to identify weaknesses:	Y	N	N/A
5.	Was Post Evaluation Checklist used:	Y	N	N/A
6.	Are recommendations required:	Y	N	N/A
7.	Are persons responsible for implementing recommendations identified:	Y	N	N/A
8.	Was a timeframe for implementing recommendations identified:	Y	N	N/A
9.	Were recommendations communicated to: Management	Y	N	N/A
	JHSC	Y	N	N/A
	Employees	Y	N	N/A
10.	Were all documents placed in central file:	Y	N	N/A
11.	Is there a need for a follow up simulation:	Y	N	N/A

Appendix D: Sample Point-in-time Evaluation

Below is sample documentation for a Point-in-Time evaluation for ABC mine. ABC Mine is a small fictional mine with a mill located 100 km from the nearest town. The mine has a workforce of 225 men: 162 underground, 41 supervisors and 22 support divided over three shifts.

Point-In-Time Evaluation ABC Mine April 10th, 2007

Purpose: The point-in-time evaluation is to test the availability and response time of mine rescue teams in the event of an actual emergency.

Benefits: To gain a realistic idea of the availability and response time of mine rescue workers in the event of an actual emergency.

Simulation Set-Up:

Role of the Facilitator: The facilitator for the evaluation will be the mine rescue coordinator. The facilitator will attempt to contact each mine rescue team member starting at a pre-determined time. The facilitator will record who he was able and unable to contact. If team members are available, the CO will record their approximate time of arrival at the mine site. If mine rescue team members were unavailable the facilitator will record why they were unavailable.

Schedules and Records:

Up-to-date list of mine rescue team members and their current phone numbers
Telephone, dedicated phone line
Sheet to record availability and location of each mine rescue team member

Surprise Element: Advanced knowledge of a Point-in-Time evaluation planned for April 14 will be limited to two people: The mine rescue CO and the mine superintendent.

Learning Outcome: To determine if the availability of mine rescue team members is adequate to deal with an emergency event.

Point of Termination: The exercise will end when the mine rescue CO has attempted to contact each mine rescue team member.

Operational Guidelines

The evaluation will follow the procedure for contacting mine rescue teams as outlined in ABC Mine's Emergency Response Plan.

Procedure:

Upon notification of a mine emergency the mine rescue Coordinator will contact mine rescue team members and ask them to report to the staging area within 30 minutes. The mine rescue CO will use the list of mine rescue team members and phone numbers located in Room 3A.

Safety Considerations: Upon contacting mine rescue team members, the facilitator will first inform the team members that the phone call is part of a point-in-time evaluation; no actual emergency is taking place and members are not required to report to the staging area.

Measuring Performance:

The facilitator should record each attempted contact with a mine rescue team worker. For a successful evaluation, ten members must be able to report to the staging area within 30 minutes.

Sample Evaluation Notes:

Mine Rescue Roster Roll Call
April 14, 2007, 7:00 am

Name	Phone	Available –ETA	Unavailable-Reason
Shelby Leech	###-####		Underground
Kurtis Faast	###-####	7:20 am	
Jonathan Zoucks	###-####	7:40 am	
Mike David	###-####		Underground
Claude Watson	###-####		Off sick
Miles Riggle	###-####	7:45	
Wesley Muller	###-####	7:15	
Edison Brown	###-####		Underground
Louie Klockman	###-####		Underground
Fermin Rosenstiehl	###-####	7:15	
Floyd Steele	###-####	8:00	
Rolando Unk	###-####	7:15	
Total Unavailable			5
Total Available		7	

Team #1 - 7:30 start - Incomplete – Missing one member	
Mine Rescue Team #1	ETA
1. Captain: Kurtis Faast	7:20
2. Wesley Muller	7:15
3. Fermin Rosenstiehl	7:15
4. Rolando Unk	7:15
5. Jonathan Zoucks	7:40 (10 minutes late)

Team #2 - 8:30 start - Incomplete – Missing two members	
Mine Rescue Team #2 – 8:30 start	ETA
1. Miles Riggle	7:45
2. Floyd Steele	8:00
3. <i>VACANT</i>	
4. <i>VACANT</i>	
5. <i>VACANT</i>	

Conclusions

A Point-in-Time evaluation conducted on April 14, 2007 at 7:30 am failed to gather two mine rescue response teams at the mine staging area. Of the twelve trained employees; four were working underground, one was sick and seven had varied times they could arrive at the mine. Had an actual emergency taken place at the mine on April 14th, an adequate mine rescue team could have not been formed.

Recommendations

The mine should have more employees trained as mine rescue team members. With three shifts, chances are that one-third of trained members would be underground at any given time. It is recommended at least 25 people are trained in mine rescue to take into account the one third that would be underground as well as leave a buffer for illness and vacation time.

Appendix E: Sample Full-Scale Simulation

Full Scale Simulation – March 7, 2008 Final Report

Scenario:

At 9:00 am on March 7th, a simulation was initiated when a pre-determined operator, Camryn Scharader, contacted surface to inform them a scooptram was on fire at 610x-cut. This set in motion the company's emergency response plan which included the injection of stretch gas. As the simulation evolves the following information should be determined by the control group:

- There is one man missing underground – the operator who phoned the scooptram fire in (the operator remained with the scooptram to inform the mine rescue team, upon their arrival, that the emergency was a simulation). This individual is unaccounted for until the team arrives at the scooptram, which is the site of the fire.

Role of the Facilitator: The facilitator for the simulation was the Mine Rescue Coordinator who scoped the simulation, selected the timing and briefed the scooptram operator in advance of the exercise.

Surprise Element: The planning of a full-scale simulation for March 7 was limited to two people: The mine rescue coordinator and the mine manager. The scoop tram operator who notified surface of the fire was a trained mine rescue volunteer and was told that the incident needed to be a complete surprise in order to effectively evaluate the mines emergency plan.

Learning Outcome: The purpose was to determine if, at a randomly selected time, training, resources, and emergency response procedures were adequate and effective for responding to a mine emergency.

Point of Termination: It was decided in advance of the simulation that the exercise would end when the mine rescue team meets up with the scooptram operator at 610 XC. Following the completion of the simulation, the mine rescue team serviced their equipment, conducted a debriefing with the control group and made recommendations that would be included in the follow-up report.

Operational Guidelines

The procedures as outlined in ABC Mine's Emergency Response Plan were used as the foundation for the exercise.

Measuring Performance:

The performance of the workers, control group, briefing officer and mine rescue teams was evaluated against the established emergency response procedures. Elements included:

- Release of stench gas
- Speed of formation of control group
- Time required to assemble and deploy the first team
- Time required to assemble a back-up team.

Establishing the Control Group

Time Log

This section completed by the scribe during the simulation

Control Group Room Location:	Engineering section Boardroom	
Assigned Control Group Roles and Arrival Times		
Title	Name	Arrival Time
Control Officer	Lyle Fasst	9:35
Advisor	Mona Fowler	9:30
Mine Manager	Roswell Schmidt	9:20
Senior Engineering Engineer	Perry Basmanoff	9:30
Ventilation Engineer	Casimir Haile	NA
Ground Control Engineer	Reggie Fiscina	9:20
Media/Communications Liaison	Wilmer Howard	9:25
Human Resources Co-ordinator	Bonita Branson	9:30
Security Officer	Pete Bloise	9:35
First Aid	Marcie Schere	9:20
Scribe/Operations Recording	Jaylin Vorrasi	9:20

Control Group Equipment/Materials/Resources

This section completed by the scribe when equipment was present and/or functioning

Equipment	Time Available
Computers – login, passwords available	9:50
Printers – functioning	9:50
Phone – numbers, extensions assigned	9:35
Phone – dedicated line assigned to refuge stations	9:35
Phone lists – Miners & Families	9:40
Phone lists – Media	9:40
Ambulance contacted	9:40
Up-to-date mine ventilation plan layout	9:35
Engineering Plans	9:35

Control Group Key Tasks

This section to be completed by the scribe during simulation

Task	Completed By	Time
Tag Board Information gathered	Marcie Schere	9:30
Refuge Station Roll Call	Mona Fowler	9:40
Refuge Data cross referenced with tag board – missing miners (if any) established	Marcie Schere	10:05
Assignment given to Briefing Officer	Lyle Fasst	10:10
Follow-up with Briefing Officer, findings of first mine rescue team	Lyle Fasst	10:25
Contact made with families	N/A	
Media contacted	N/A	
MOL contacted	N/A	

Establishing Control Group Personnel and Equipment

Post-Simulation Review

This section is to be completed by Mine rescue coordinator or assigned MR contact during the de-briefing session

At what time was the Control Group established:	9:35
Was this acceptable?	Yes
At what time was team ready for briefing?	9:50
Was this time reasonable?	Yes
Problems encountered when establishing Control Group personnel: Able to assemble appropriate people for the emergency?	
The ventilation engineer was not available due to personal reasons and the mine engineer was assigned to take over his duties.	
Problems encountered with equipment set-up for control room:	
Up-to-date ventilation plans were not available in the control room which resulted in confusion when the control group was first assembled. Although ventilation plans are updated on a monthly basis and were available in the four other locations, they were not placed in the control room.	
Recommendations and Conclusions:	
A new procedure was established which ensures 5 copies of updated ventilation plans are placed in each department office on the first Friday of the month and include the control room.	

Mine Rescue Roster Roll Call

March 7, 2008, 9:00 am

To be completed during the simulation

Name	Phone	Available –ETA	Unavailable-Reason
Shelby Leech	###-####		Underground
Kurtis Faast	###-####	9:20 am	
Jonathan Zoucks	###-####	9:40 am	
Mike David	###-####		Underground
Claude Watson	###-####	9:15 a.m.	
Miles Riggle	###-####	9:45 a.m.	
Wesley Muller	###-####	9:15 a.m.	
Edison Brown	###-####		Underground
Louie Klockman	###-####		Underground
Fermin Rosenstiehl	###-####	9:15 a.m.	
Rolando Unk	###-####	9:15 a.m.	
Total Unavailable			4
Total Available		7	

Team #1 – 9:30 ready for briefing

Mine Rescue Team #1	
1. Captain: Kurtis Faast	9:20 a.m.
2. Wesley Muller	9:15 a.m.
3. Fermin Rosenstiehl	9:15 a.m.
4. Rolando Unk	9:15 a.m.
5. Claude Watson	9:15 a.m.

Team #2 - 10:00 ready for briefing

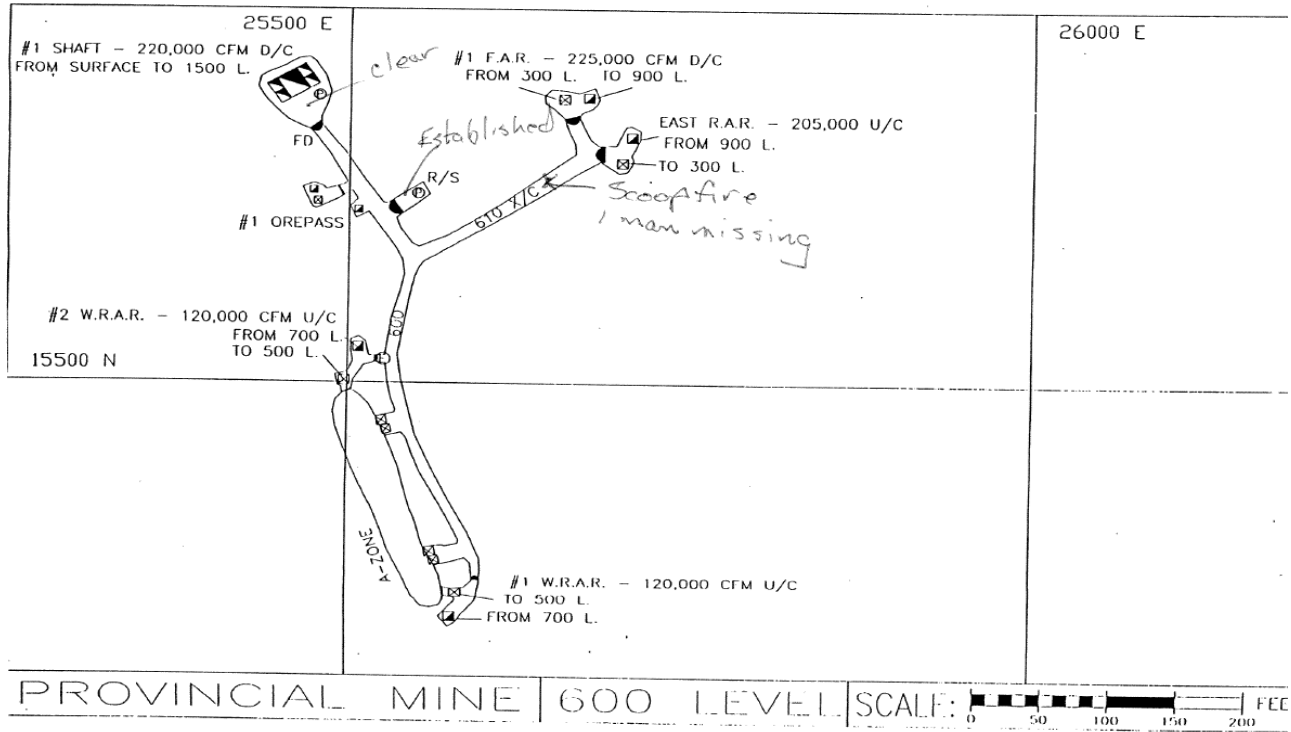
Mine Rescue Team #2 – 8:30 start	
1. Captain: Jonathan Zoucks	9:40 a.m.
2. Miles Riggle	9:45 a.m.
3. VACANT (<i>Mutual Aid Agreement with Bull Mine</i>)	9:50 a.m.
4. VACANT (<i>Mutual Aid Agreement with Bull Mine</i>)	9:50 a.m.
5. VACANT (<i>Mutual Aid Agreement with Bull Mine</i>)	9:50 a.m.

Establishing Control Group Personnel and Equipment Post-Simulation Review

This section is to be completed by Mine rescue coordinator or assigned MR contact during the de-briefing session


At what time were the Mine Rescue teams assembled:	Team #1 at 9:30 a.m., Team #2 required 2 men from Bull Mine
Was this time reasonable?	Team #1: yes, Team #2, no
At what time had teams field tested standard equipment and ready for briefing?	Team #1 9:40 a.m. Team #2 10:00 a.m.
Was this time reasonable?	Team #2 required 2 volunteers from neighbouring Bull mine.
Problems encountered when contacting mine rescue personnel:	
Four mine rescue volunteers went to the refuge stations when they smelled stench gas and were unavailable to participate in the rescue simulation exercise. ABC mine was able to assemble one mine rescue team promptly, but a back-up team could not be assembled with ABC volunteers. ABC has a mutual aid agreement with the Bull mine and 2 mine rescue volunteers were available by 9:50 a.m.	
Problems encountered with equipment set-up for the mine rescue team:	
Team #1 prepared standard equipment with minor problems noted. One of the itx units wasn't charged. It appears that someone had inadvertently unplugged the charger. The team noted that there were only 12 blocks of ice in the freezer and the mine had to contact Bull mine to get additional ice. Team #2 was being assembled on site as number 1 team proceeded underground. The mine substation has sufficient breathing apparatus for only one team however the mine rescue officer arrived on site just as the first team completed being briefed.	
Recommendations and Conclusions:	
An additional 6 volunteers should be trained in mine rescue to ensure an adequate pool of trained men. Arrangements have been made with the Mine Rescue officer to deliver an Introductory session next month. We need to make sure new trainees are distributed among shifts so there are ten trained men per shift. Although ABC has a good relationship with the neighbouring Bull Mine, relying on them for mine rescue back-up should be considered as a last resort. ABC should be able to supply first and second response particularly when taking into consideration the size of their workforce. To achieve this, the mine will need a minimum of ten trained men per shift. Also, ABC will review location where volunteers are being recruited from and try to attract some individuals from their surface and mill sites. These individuals are not required to spend as much time underground and will help to boost the number of available mine rescue volunteers at any given time.	
The mine rescue technician was assigned the responsibility of ensuring sufficient ice is available. Although this was a simulation it was realized that if this was a real emergency they mine did not have sufficient ice for subsequent teams. The new procedure will ensure that the mine rescue technician ensures the freezer is maintained full of blocks of ice and they are properly cycled to prevent blocks from congealing.	

ABC Mine Map - Mine Rescue Team Notes



Briefing Officer's Notes

BRIEFING OFFICER'S REPORT

		Time Under O ₂ : <u>10:20</u>		Briefing Officer: <u>Jim Howard</u>								
Team No.: <u>1</u>		Date: <u>Mar. 07/08</u>		Page <u>1</u> of <u>1</u>								
Captain: <u>Kurtis Faust</u>		Mine: <u>ABC</u>		MIR Officer:								
Time	Location	Smoke	CO	O ₂	CH ₄	DOOR	Fan	Flow	Team	Time	Location	Report
10:25	NF	-	0	20.9						10m	600	10:00 - Met with Control - Scoop fire 610 x cut 1 man missing
10:28	600	-	0	20.9						20m	610	10:15 - Brief team sent to 610 x cut Stretch injected 1 man missing #2 team onsite MRO onsite seen with more equipment
10:40										20m	Surface	10:25 - Team in headframe Clear
10:40	610	-	0	20.9								10:28: Team on 600. Clear Check Refuge Station on way
												10:40 - Found man no fire fire drill
												10:50 - Team on surface Auto O ₂

