2012 Metal and Nonmetal National Mine Rescue Contest Rules

U.S. Department of Labor
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Secretary

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Visit the Mine Safety and Health Administration Web site at www.msha.gov

PREFACE

This booklet was prepared for mining industry instructors, MSHA instructors and inspectors to train mine rescue teams, judges, and contest personnel in procedures for a mine rescue contest.

Reference to specific brands, equipment, or trade names in this report is made to facilitate understanding and does not imply endorsement by the Mine Safety and Health Administration.

MISSION STATEMENT

The Metal and Nonmetal National Mine Rescue Contest serves as a training tool to improve the skills required to respond to a mine emergency. The National Contest Rule Book establishes procedures and rules that serve to guide the rescue teams in actual situations. This competition serves to strengthen cooperation between mining companies, equipment manufacturers, Federal and State agencies to enhance mine rescue preparedness.

ACKNOWLEDGMENTS

A special thanks to the National Metal and Nonmetal Advisory and Planning Committees for their valuable assistance in preparing this booklet.

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The following organizations are recognized for the resources and personnel they committed in support of the biannual National Metal and Non-metal Mine Rescue Contest.

Biomarine, Inc.

Central Mine Rescue Unit

Colorado Division of Reclamation, Mining, and Safety

CSE Corporation

Draeger Corporation

DXP Enterprises

Joseph A. Holmes Safety Association

Industrial Scientific Corporation

Kansas Mine Rescue Association

Missouri Mine Rescue Association

Mine Safety Appliances Co.

National Mine Rescue Association

Nevada Mine Rescue Association

Northern Mine Rescue Association

Southeast Central Kentucky Mine Rescue Association

Southern Mine Rescue Association

Southwestern Mine Rescue Association

Southwestern Wyoming Mutual Aid Association

United Central Industrial Supply

2010 NATIONAL CHAMPIONS
MINE RESCUE FIELD CONTEST

The Doe Run Company

Doe Run Maroon – Vibrnum, MO

Steve Setzer, Captain
Luke Davis, Technician Team
Shawn Pratt
Jerry Laramore, First Aid
M. Andrew Hampton, First Aid
Denny Dickerson
Steve Kearns, First Aid
Ricky Martin, Technician Team
Dan King, Team Trainer/Official in Charge

PREVIOUS NATIONAL CHAMPIONS
MINE RESCUE FIELD CONTEST

2008 **FMC Alkali Chemicals,** FMC Red Team, Green River, Wyoming
2006 **FMC Corporation**, FMC at Westvaco Mine, FMC White Team, Green River, Wyoming
2004 **OCI Wyoming, L.P.,** Big Island Mine, White Team, Green River, Wyoming
2002 **FMC Westvaco Mine,** FMC 1, FMC Corporation, Green River, Wyoming
2000 **Big Island Mine**, OCI Blue Team, OCI of Wyoming, L.P., Green River, Wyoming
1998 **FMC Mine**, Red Team, FMC Corporation, Green River, Wyoming
1996 **Big Island Mine,** White Team, OCI of Wyoming, L.P., Green River, Wyoming
1994 **Waste Isolation Pilot Project**, Blue Team, Westinghouse Electric Corp. - Carlsbad, New Mexico
1992 **Big Island Mine,** White Team, Rhone Poulenc of Wyoming, Green River, Wyoming
1990 **Magmont Mine Team,** Cominco American Bixby, Missouri
1988 **Homestake Mine,** Gold Team, Homestake Mining Company, Lead, South Dakota
1986 **Big Island Mine,** White Team, Stauffer Chemical Company, Green River, Wyoming
1984 **Texasgulf Mine,** Gold Team, Texasgulf Chemicals Company, Granger, Wyoming
1982 **Big Island Mine,** Blue Team, Stauffer Chemical Company, Green River, Wyoming
1980 **Lisbon Mine Team,** Rio Algom Corp. - Moab, UT
1978 **Jefferson Island Mine Team,** Diamond Crystal Salt Co., New Iberia, Louisiana
1976 **Magmont Mine Team,** Cominco American Bixby, Missouri (Single-Level Contest)
1976 **Magmont Mine Team,** Cominco American Bixby, Missouri (Multi-Level Contest)
1975 **Big Island Mine,** White Team, Stauffer Chemical Co., Green River, Wyoming
1973 **Grand Saline Mine Team,** Morton Salt, Division of Morton Norwich Products, Inc. - Grand Saline, Texas

2010 NATIONAL CHAMPIONS
TECHNICIAN TEAM CONTEST

(Note: Replaced Benchman and Gas Instrument Contests)

FMC Alkali Chemicals
FMC White, FMC 8 Shaft, Green River, Wyoming
Alan Jones and Tyler Lovato

PREVIOUS NATIONAL CHAMPIONS
BENCHMAN'S CONTEST

2008 **TYLER LOVATO,** (BG-4), OCI of Wyoming, Big Island Mine, OCI Blue Team - Green River, Wyoming

ROBERT RODRIGUEZ, (BIOPAK), Barrick, TSRV Mine, TSRV Team 2 - Golconda, Nevada

2006 **CURTIS SANDERS,** (BG-4), WIPP Silver Team, Washington True Solutions – Carlsbad, New Mexico

RICKY MARTIN, (BG-174A), The Doe Run Maroon Team, The Doe Run Company - Viburnum, Missouri

TOM SENECAL, (BIOPAK), Newmont Gold Team, Newmont Mining Corporation – Carlin, Nevada

2004 **MACLANE BARTON,** (BG-4), Sugar Creek Mine Limestone Lizzards, Lafarge North America - Sugar Creek, Missouri

GARRY MOORE, (BG-174A), Southeast Missouri Mining and Milling Division, Doe Run Grey Team, The Doe Run Company - Viburnum, Missouri

ROD CHRISTENSEN, (BIO-PAK), Barrick Goldstrike Mine, Barrick Goldstrike Mines, Inc - Elko, Nevada

2002 **LESLIE WAREHAM,** (BG-4), General Chemical Blue, General Chemical Soda Ash Partners - Green River, Wyoming

DENISE RICH, (BG-174A), Stillwater Mine, Stillwater Mining Company - Nye, Montana

DAN LUKE, (BIO-PAK), Carlin Underground Mine, Newmont Mining Corporation - Carlin, Nevada

2000 **JOE BACA,** (BG-4), Blue Team, Waste Isolation Pilot Project, Westinghouse Electric Corporation - Carlsbad, New Mexico

RICHARD WEST, (BG-174A), Silver Team, Waste Isolation Pilot Project, Westinghouse Electric Corporation - Carlsbad, New Mexico

ROD CLEMENT, (Biopak 240), No. 4 Mine & Mill, Zinc Corporation of America - Hailesboro, New York

1998 **JOE BACA,** Waste Isolation Pilot Project, Westinghouse Electric Corporation - Carlsbad, New Mexico

1996 **MACLANE BARTON,** West Fork Mine, Missouri Lead Division, ASARCO, Inc. - Bunker, Missouri

1994 **FRED MILLER,** Waste Isolation Pilot Project, Westinghouse Electric Corporation - Carlsbad, New Mexico

1992 **LESLIE WAREHAM**, General Chemical Mine, General Chemical Partners - Green River, Wyoming

1990 **STAN AMRINE**, Parachute Creek Mine, Unocal Mining Division - Parachute, Colorado

1988 **KARL SAUER**, Homestake Mine, Homestake Mining Co. - Lead, South Dakota

1986 **ART DAVIS**, Henderson Mine, Amax, Inc. - Empire, Colorado

1984 **STEVE YANCHUNIS**, Schwarzwalder Mine, Cotter Corp. - Golden, Colorado

1982 **ART DAVIS**, Henderson Mine, Amax, Inc. - Empire, Colorado

1980 **ALAN HERMEZ** (Draeger), Carr Fork Mine, Anaconda Copper Co. - Tooele, Utah

1980 **RODNEY PHILBRICK** (McCaa), Pine Creek Mine, Union Carbide - Bishop, California

1978 **WILLIE DAVIS** (McCaa), Lisbon Mine, Rio Algom Corp. - Moab, Utah

1978 **KEN JOHNSON** (Draeger), Climax Mine, Climax Molybdenum Co. - Climax, Colorado

1976 **STEVE MURRAY**, Bunker Hill Mine, Bunker Hill Co. - Kellogg, Idaho

PREVIOUS NATIONAL CHAMPION GAS INSTRUMENT BENCH CONTEST

2008 **RICK OWENS,** FMC Alkali Chemicals, FMC Red Team - Green River, Wyoming

2006 **RICK OWENS,** FMC Westvaco Mine, FMC Red Team, FMC Corporation - Green River, Wyoming

2004 **RICK OWENS,** FMC Westvaco Mine, FMC Red Team, FMC Corporation - Green River, Wyoming

2010 NATIONAL CHAMPIONS
FIRST AID CONTEST

FMC Alkali Chemicals

FMC RED, FMC 8 Shaft, Green River, Wyoming
Robert Pope, Team Captain
Bill Madura and Anton Kolan

PREVIOUS NATIONAL CHAMPIONS
FIRST AID CONTEST

2008 **Goldstrike Mines Inc.,** Barrick Gold, Gold Strike Mine, Elko, Nevada, Mike Peck, Team Captain

2006 **Barrick Goldstrike Mines Inc.**, Barrick Gold Team, Elko, Nevada, Ken Groves, Team Captain

2004 **General Chemical Soda Ash Partners**, General Chemical Mine, General Chemical Blue, Green River, Wyoming, Mickey Smith, Team Captain

2002 **Carmeuse Lime, Inc.**, Maysville Mine, Maysville Mine Raiders, Maysville, Kentucky, Gary Lewis, Team Captain

2000 **Dravo Lime, Inc.**, Maysville Mine, Maysville Mine Raiders, Maysville, Kentucky, Gary Lewis, Team Captain

2010 NATIONAL MINE RESCUE COMBINATION CHAMPION

Solvay Chemicals Inc.

Solvay Chemicals Mine, Silver Team, Green River Wyoming
Joe Thompson, Captain, First Aid
Chad Rawlings, Technician Team
Bob Clement
Jamie McGillis, First Aid
Scott Brown, Technician Team
Kent Bowman, First Aid
Del Hauser
Jeff Jetmore, Team Trainer
Dave Stevenson, Official in Charge

PREVIOUS NATIONAL CHAMPIONS
COMBINATION CHAMPION

2008 **FMC Alkali Chemicals,** FMC Red Team, Green River, Wyoming

2006 **Barrick Gold Team**, Barrick Goldstrike Mines, Inc., Elko, Nevada

2004 **WIPP Silver Team**, Waste Isolation Pilot Plant, Washington TRU- Solutions, Carlsbad, New Mexico

2002 **WIPP Silver Team**, Waste Isolation Pilot Plant, Washington TRU-Solutions, Carlsbad, New Mexico

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GENERAL RULES
FOR CONDUCTING THE CONTEST

1. The contest will be comprised of four individual events, including a Mine Rescue contest (field competition: two-day preliminary and one day final), a Technician Team contest, a First Aid contest, and a Team Trainer Test. Each event will include a written examination.
2. Contest officials will be comprised of the Contest Director, Contest Coordinator, Chief Judge, Appeals Committee, field competition judges (including: field judges, mine managers, and mine attendants), isolation officials, written exam judges, technician team contest judges, and first aid contest judges.
3. There will be no limitations to the number of teams admitted from any county, state, district, company, or organization. There will be a **$750.00** entry fee for each team entered. The entry fee will include up to 10 banquet tickets. Additional banquet tickets will be available for purchase during registration.
4. All members of teams must be bona fide employees of the metal and nonmetal mining industry and meet the requirements set forth in 30 CFR Part 49.
5. Mine rescue teams may register up to eight team members and one trainer. For the purpose of technician team and first aid contests, a team member may not participate in more than one event and each team will only be permitted to compete in each event once. The technician teams must compete with the same type of breathing apparatus and multi-gas instrument that their teams will be using for the mine

rescue field contest. For the purposes of identification, participants of the Mine Rescue Field, Technician Team, and First Aid Contests must be dressed uniformly, complete with team logo. This includes the testing process. Once registered, no changes will be permitted without the permission of the Contest Director.

Entry forms may be obtained by a written request or by email to:

Metal and Nonmetal Mine Safety and Health Administration
1100 Wilson Boulevard, Room 2444
Arlington, Virginia 22209
Attention: Christine Mayhugh

Telephone Number: (202) 693-9609
Email address: mayhugh.christine@dol.gov

Entry forms will also be available on MSHA's homepage under the "Mine Rescue" heading at **www.msha.gov**

Entries should then be submitted to the above address at least sixty (60) days prior to the date of the contest. The entry forms will require information regarding the type of equipment (breathing apparatus) each team will be wearing and the type and model of all gas testing equipment the team will use during the field competition. Any needed equipment changes require submission of a modified list to the Contest Director for consideration of approval. (Note: Each judge will be given a list of your equipment prior to working of the problem to assist them in determining if the equipment was utilized properly and was functional.)

6. Prior to the contest, contest equipment will be accepted at an address and during a time frame to be specified. The cost of all shipments must be prepaid, and all boxes, cartons, etc. should be clearly labeled "Hold for National Mine Rescue Contest."
7. On the day before the contest begins, team registration will be conducted between 1:00 p.m. and 6:00 p.m. at a designated location. Programs and banquet tickets will be distributed to the teams. Team equipment shall be secured in isolation no earlier than 9:00 a.m. and no later than 4:00 p.m.
8. The team drawings for the first two days' preliminary field competitions will be conducted at the time of team registration. A separate drawing (by team captains) will be held in isolation to determine running order for the final competition on the third day. Position changes necessary for management of the contest will be permitted if the Contest Director approves the change.
9. Team positions for technician team and first aid contests will be in reverse order from the team's field competition drawing.
10. On the days of the competition, all teams shall be in isolation by 7:00 a.m. No wireless communication device will be permitted in isolation.
11. The results from all elements of the contest will be mailed to each team.
12. All hours mentioned in the rules are based on local time.
13. All judges will be persons trained in mine rescue procedures; trained in the assembly,

use, and care of the different types of breathing apparatus; and trained in the assembly, use, and care of the different types of multi-gas instruments. The judges will not be connected with any of the teams, teams' employers, or companies who manufacture apparatus or gas detecting devices. Exceptions to personnel assigned for judging any phase of the contest requires the approval of the Contest Director.

14. ...WARNING... Any team whose member(s) intentionally disturb or destroy any component on a competition field will immediately be assessed a 100 point discount. Repeated offense may result in team disqualification at the discretion of the contest director.

TEAM TRAINER TEST

1. On the first day of the competition, all team trainers shall be in isolation by 7:00 a.m. No wireless communication device will be permitted in isolation.
2. The written tests will be administered in isolation to the team trainers at the same time, unless authorized otherwise by the Contest Director. The written test will be given in conjunction with the written tests for the Mine Rescue Field Competition, Technician Team Contest, and the First Aid Contest. A total of 60 minutes will be allowed to complete all required testing. At the end of the allotted time, tests will be collected regardless of whether or not the contestants have answered all of the required questions.
3. The written test will consist of thirty (30) multiple choice and true/false questions. The questions will be taken from:
   - Material contained in MSHA Publication 3027 – Instructor's Manual for Mine Rescue Training (formerly MSHA Publication "IG 6"). The training modules in Publication 3027 are as follows: Module 1 – Surface organization; Module 2 – Mine Gases; Module 3 – Ventilation; Module 4 – Exploration; Module 5 – Fire, Firefighting, and Explosions; Module 6 – Rescue of Survivors and Recovery of Bodies; and Module 7 – Mine Recovery.
   - Eighth Edition of Brady "First Responder", Chapters: 4, 5, 6, 7, 8, 9, 10, and 11.
   - The Federal Mine Safety and Health Act of 1977 (The "Act").

- Title 30 Code of Federal Regulations Part 49 Mine Rescue Teams, Subpart A – Mine Rescue Teams for Underground Metal and Nonmetal Mines.
- Current MSHA National Metal and Nonmetal Mine Rescue Contest Rules.
- Generic questions covering the use and care of self-contained breathing apparatus and multi-gas instruments.

Contestants will be assessed one (1) discount point for each incorrect or unanswered question. Any alterations to the test questions or answers will be determined to be incorrect by the test judge and discounts assessed.

4. Scoring of the test will be completed by at least two qualified judges.
5. In special circumstances, individual team members may be given an oral test by one or more judges in lieu of a written test. Requests for consideration shall be presented to the Contest Director at the time of registration. All other team members will take the test at the same time. In any case, the judges will not explain the meaning of questions, but may explain a word or words in the questions.
6. The team trainer with the least amount of discounts on the written test will be the winner. In the event of a tie, the team trainer with Overall Mine Rescue Champion Team will determine the winner. The second tie breaker would be the team trainer with the best mine rescue team standing in the Mine Rescue Field Competition.

NATIONAL MINE RESCUE CONTEST (FIELD COMPETITION)

1. The Contest Director will establish a reasonable amount of time for each team to complete the problem. All teams will be notified of the established time prior to beginning to work the problem. Any teams working beyond the established time period will be notified by the #1 Judge that they must leave the field. All teams will be scored based on their discounts, including: appropriate discounts for items missed in areas left unexplored or abandoned by the team; and appropriate discounts for necessary actions not taken by the team to complete the mission.
2. The third day finalists will be posted at a location designated by the Contest Director following the conclusion of the second day of competition.
3. In the event of mine rescue field competition ties, the underground discount sheet will be the first tie breaker, the surface discount sheet will be the second tie breaker, mine maps will be the third tie breaker, the written test will be the fourth tie breaker, and time will be the fifth tie breaker. Teams that qualify for the field competition on the final day will have their written test scores carry over to the final day and become part of the team's composite score.
4. Discounts will not be added to the team's field score once the judges have signed their discount sheets. This does not preclude changes due to administrative errors or a misapplication of a rule.

5. ... WARNING ... Any team whose member(s) intentionally disturb or destroy any component on a competition field will immediately be assessed a 100 point discount. Repeated offense may result in team disqualification at the discretion of the contest director.
6. After the scorecards are checked by the scorecard examiners, they will be taken to a designated location. The team captain, trainer, and one other team member may examine their team's scoring cards for a time not to exceed 20 minutes. No protest of the discounts assessed may be given to the person in charge of the review, however, the team captain and/or trainer may protest in writing any discount within 30 minutes after reviewing them. Written appeals are not to exceed one page for any discount assessed and will be submitted to the Appeals Committee.

   Documentation (contest rules and other documents used in the contest) supporting the appeal will be accepted. Any protest(s) will be considered by the Appeals Committee. A discount summary sheet will be used to list the discounts. All discounts except time will be listed and totaled. Both the captain and the review judge will sign the discount sheet to certify they have reviewed the discounts and verified the totals. (See page 48.)
7. The Appeals Committee shall rule in matters concerning any interpretations, procedures, or any matter involving proper conduct of the Contest. Any complaints filed with the committee shall be in writing and shall set forth incidents, times, names, source of information, and the act complained against. Where a

written test question or rule application was found to be wrong, all teams will receive the appropriate correction. A decision by a majority of the committee shall be binding.

GUIDELINES AND PROCEDURES

Team Members

Each team shall be composed of five members, one fresh air base attendant and one assistant (optional). Each member shall wear a number on the arm at or near the shoulders with number one (1) being assigned to the captain, the number six (6) to the fresh air base attendant and seven (7) to the assistant. Switching of numbers by team members will not be permitted after arriving at the portal or fresh air base. Any means of affixing legible numbers on the sleeve of the uniform will be acceptable. Additional persons, who had been isolated with the team, may assist the team placing equipment prior to starting the clock. Only the fresh air base attendant and the assistant will be allowed to assist the team after the clock has started. The fresh air base attendant and assistant will be isolated from visual contact with the field while the teams are in the mine. The fresh air base attendant will maintain voice communications with the team utilizing a portable, hard wire, communications system. The assistant may listen in with a separate headset and advise the fresh air base attendant and interact with the team only when they are at the fresh air base, however, the assistant cannot substitute for anyone.

Teams wishing to communicate with the fresh air base attendant shall use their portable communication system, or they must return to the fresh air base.

Medical Requirements

At the time of registration for the contest, a company official must sign to verify all mine rescue team members have completed physical examinations in the past 12 months preceding the contest and are capable of performing strenuous work under oxygen.

Equipment

Breathing apparatus approved for at least four hours shall be used in the Mine Rescue Contest problems. Each team member must have his/her own approved breathing apparatus. Teams cannot expect recharging materials, apparatus parts, and accessories for all types of apparatus at the contest site.

Team members must wear an approved protective hat, identification tag, safety shoes, permissible cap lamps, self-rescuer, and be clean shaven to the extent that a good face-to-facepiece seal is achieved.

Each team must have approved gas instruments, or testers for rescue and recovery work.

Teams are required to bring with them a sufficient supply of materials. Brattice, boards, PVC piping, or other materials necessary for constructing bulkheads or stoppings (if necessary in problem) will be furnished by the field committee. Teams will be responsible for collecting the material from the source of supply.

When teams report to the fresh air base to begin the problem and are given information indicating that explosive gas(es) is/are or may be present in the mine, they must have non-sparking tools while they are working the problem so as not to endanger themselves. If teams do not have non-sparking tools, they must ask the official in charge at the fresh air base to provide them with such tools before they go underground.

If the mine is not classified as gassy and the teams go underground to work the problem and encounter an explosive gas and they do not have non-sparking tools, they must return to the fresh air base immediately and ask the official in charge to provide them with such tools.

Team Preparation (Apparatus)

Team members must make necessary checks of all apparatus for proper working condition and airtightness prior to going underground. Cylinder pressures must be within specifications of approval. Apparatus tests must comply with prescribed tests for that particular type of apparatus.

An approved 4-hour oxygen breathing apparatus must be used on the survivor(s) or other rescued personnel when respiratory protection is needed. One-hour self-rescuers are not to be used for the evacuation or rescue of survivors.

Written Test

The written test will be given in conjunction with the written tests for the Technician Team and the First Aid contests. A total of 60 minutes will be allowed to complete all required testing. At the

end of the allotted time, tests will be collected regardless of whether or not the contestants have answered all of the required questions.

Written tests will be administered in isolation to the six competing participants at the same time, unless authorized otherwise by the Contest Director. The questions for the written test will be taken from material contained in MSHA Publication 3027-Instructor's Manual for Mine Rescue Training (formerly MSHA Publication "IG 6"). The training modules in Publication 3027 are as follows:

- Module 1 – Surface Organization;
- Module 2 – Mine Gases;
- Module 3 – Ventilation;
- Module 4 – Exploration;
- Module 5 – Fire, Firefighting, and Explosions;
- Module 6 – Rescue of Survivors and Recovery of Bodies; and
- Module 7 – Mine Recovery.

MSHA Publication 3027 (IG-6) is available on the MSHA homepage at http://www.msha.gov/MineRescue/Training/TeamTraining.asp or at the following address:

U.S. Department of Labor
National Mine Health and Safety Academy
ATTENTION: Printing and Training Materials Distribution
1301 Airport Road
Beaver, WV 25813-9426

Telephone: (304) 256-3257
Fax: (304) 256-3368
Email: MSHADistributionCenter@dol.gov

The written test of thirty (30) questions will include at least ten (10) questions on mine gases from MSHA Publication 3027 (Module 2 – Mine Gases) for each team member. The questions shall consist of true/false and multiple choice questions.

All tests will be scored by two qualified judges using a Scantron test scoring machine. The contestants will be assessed one (1) discount point for each incorrect or unanswered question. Any alterations to the test questions or answers will be determined to be incorrect by the test judge and discounts assessed.

In special circumstances, individual team members may be given an oral test by one or more judges in lieu of a written test. Requests for consideration shall be presented to the Contest Director at the time of registration. All other team members will take the test at the same time. In any case, the judges will not explain the meaning of questions, but may explain a word or words in the questions.

Judges

All judges will be persons trained in mine rescue procedures and knowledgeable in the rules, interpretations, and the procedures for working the respective problems. The judges will attend training sessions prior to the contest concerning the problems to be worked and the guidelines for working such problems. Judges will be trained in all aspects of the problems to allow for consistent and accurate judging.

Competing teams deserve the full attention of the judges and only those personnel judging the specific teams are allowed on the field. While the team is in the mine, judges must not ask questions,

answer questions, or interfere with the team. Only personnel approved by the Contest Director will be permitted on the field. Media access and videos for future training aids will be allowed with the Contest Director's approval.

During preparation, judges are to observe the captain and other team members as to their knowledge and proper operation of the self-contained breathing apparatus, gas detecting devices, other respiratory protection equipment to be used, and firefighting equipment, etc.

The mine manager will be stationed and must remain at the fresh air base when the teams are working the problem. He/she will provide answers, as necessary, to questions posed by the team, the fresh air base attendant, or the assistant.

A minimum of two (2) persons will judge the team during the entire working of the field problem. Only the Contest Director, Chief Judge, or their designee may discuss discrepancies or discounts on the field. If discussions are held on the field, interrupting the working of the problem, the time will be stopped and restarted after the discussion is over. A Mine Safety and Health Administration employee will be the #1 Judge. All judges must have current Mine Rescue Judge's Training and have been briefed on the particular problem and possible solutions.

The judges will mark and explain on their scorecards the discounts for work performed by each team member. In the event that more than one discount applies, the highest discount will be assessed for a violation. There will be no stacking of discounts. Judges must sign their scorecard after the discounts have been recorded. Scorecards

will be marked promptly and delivered to scorecard examiners as soon as possible after completion of the problem.

Security

Each team must be under guard before the start of the contest, in a location assigned by the Chief Judge, and must remain continuously under guard until time to work the problem. Any team receiving information concerning a contest problem will be disqualified. No person except guards and contest officials authorized to do so, will be allowed to communicate with any team or teams under guard. Teams that have performed will not be permitted to communicate with any teams awaiting their turn to perform.

Contest Problem

The problem may involve a multi-level mine; however, the team will be limited to working on one level. It may include hoists or shafts. Skip pockets and sumps (either above or below) will be considered part of the working level. Raises or boreholes may be in the problem; however, climbing will not be required.

Teams may have to change existing ventilation, pump water, or move falls to rescue persons and/or explore if it can be done safely. Changing ventilation shall not be done until the official in charge has been informed. Ventilation changes will be considered as starting, stopping, altering, or redirecting the air current. If existing check curtains are to be used to direct ventilation, the check curtain must first be converted into a temporary stopping. Regulating airflow to control a fire is not considered a ventilation change.

All areas that have been cleared of smoke and toxic or dangerous gases that the teams elect to travel through must be rechecked prior to the team's reentering. Upon re-entry into these areas where the ventilation has been changed, teams shall make gas tests at all openings along the route they travel.

When smoke or gas is encountered in an opening, it will be considered to extend to a placard indicating the smoke or gas is cleared, or to a separation intended, or indicated to be air tight.

If water is being pumped, ventilation changed, falls moved, loose rock barred down, etc.; teams must wait until placards have been changed by the ground committee. If placards have not been changed after 15 seconds, teams must assume that their actions were not successful.

Inaccessible areas only need to be explored when there are miners unaccounted for or if an explosive air/gas mixture will be moved through the unexplored areas. Teams may be required to pump water or set timbers to explore inaccessible areas. If this is necessary, appropriate materials will be provided in the problem.

Only judges, contest officials, escorted photographers, and news media approved by the Contest Director or Chief Judge will be permitted in the working areas.

Insofar as possible, materials rather than placards will be used in the mine. Bodies with identification may be designated by the use of dummies. When placards indicating conditions are used, they will be placed face up, and the letters shall not be less than one (1) inch in height, and easily visible.

Additionally, when these placards are used to identify mining machinery or equipment, a description of the current condition of the equipment and/or a photocopy of a picture of such machinery or equipment may be on the placard, when possible, to aid teams in identifying it.

Terms used in the problem will be terms which appear in the Glossary of this Rule Book, the MSHA Mine Rescue Training Modules, or 30 CFR - Part 49 and Part 57.

When raises, winzes or boreholes are in the problem, the card identifying them will indicate whether they go up and/or down from the level being worked.

TEAM PREPARATION AND PROCEDURES

Apparatus and Material Checks

Before reporting to the contest field, each team member must check his/her own apparatus to see if it is charged properly and in good working condition. These checks must be within the manufacturer's specified limits and the regenerator fully charged with chemicals.

Other materials such as roof testing devices, stretchers, hammers, blankets, fire extinguishers, and gas detectors must be checked to see that they are in good operating condition. If horns are to be used for signaling between team members, they should be checked. A portable communication system, utilizing insulated wire strong enough to give and receive manual signals, must be used by all teams. Wheeled stretchers will be allowed.

Briefing

When all members of the team have their apparatus fully assembled and ready to wear, the captain should assemble the team and report to the Briefing Station Official when directed by the guard. The team will be briefed on field conditions either by a video or a briefing paper. Team members will return any handouts at the conclusion of the briefing. The briefing should contain all pertinent information, including the following conditions: classification of the mine; frequency of explosive gas being found; accuracy of the mine map; possibility of the mine being cut into another mine; condition of the fan; have guards been posted; electric power cut off from the mine or affected parts of the mine; recovery work that has been accomplished; notification of the local, state, and federal agencies; reserve rescue teams, equipment, and materials that are available.

Any final adjustments to the equipment and necessary talks between team members can be completed prior to reporting to the field judge.

Reporting to Field

On reporting to the field, communication cable can be strung out prior to starting the clock. Afterward, the captain should have the team line up at the place indicated by the person in charge. The captain introduces his team and remarks "We are here to offer our help. I have a fully equipped, properly trained, and physically fit mine rescue team and we are ready to do anything that you may require in the rescue and recovery work at your mine." The official in charge will reply that they do require the service of mine rescue teams, and that if they are ready, they can be of immediate service.

Start of Problem

When the necessary introductions have been made, the team captain will indicate that they are ready for the problem and map. No work will be done until the clock is started. The captain will start the timing device and date the board (month, day, year, and team position number) before receiving the problem and the map. After the clock is started, only the five working team members, fresh air base attendant, and assistant will be permitted to do the work at the fresh air base. MSHA's field attendants will feed out and reel in the communication wire.

The fresh air base attendant will receive the problem and map at the same time. From this point on, the team members should discuss the conditions presented by the problem and the map. On the map, solid lines will denote actual workings. Although

locations may not be totally accurate within the six (6) foot map requirement, solid lines will represent known conditions. Dotted lines will denote projections and may or may not be accurate. These conditions should be studied carefully so that proper procedures may be decided in advance.

Equipment Checks and Procedures

No testing of equipment is required at the fresh air base. Testing of equipment used by the team will be performed while the team is in isolation before reporting to the field. This testing will not be judged, however, if any defects occur while working the problem, discounts will be assessed. Random checks of equipment to insure reliability may be made upon completion of the problem.

Standard Communications and Signals

A portable communication system, utilizing hard wire, will be used to inform the fresh air base of all conditions encountered. External speakers will not be permitted at the fresh air base while working the problem. In the event of a communication failure, the team will be required to return to the fresh air base to repair or replace the system.

The following standard horn blasts or other audible signals between team members will be used:

1 blast on the horn will mean for the team to "stop" if in motion

2 blasts on the horn will mean "advance"

3 blasts on the horn will mean "retreat"

4 blasts on the horn will mean "distress"

Hoist Signals

The following signals will be used for the National Contest. The conveyance shall not be moved without a command signal: when persons are to be hoisted or lowered, they must enter the conveyance and close the door; then give the signal for the desired level followed by either "Hoist Persons" (3-1 bells) or "Lower Persons" (3-2 bells).

9 Bells: Emergency - then ring mine level signal where emergency exists.

MINE LEVEL SIGNALS

Surface Shaft Collar -1-2 Bells
500 Feet First Level -2-1 Bells

HOIST SIGNAL

1 Bell - STOP
2 Bells - Lower Conveyance
3 Bells - Raise Conveyance
3-1 Bells - Hoist Persons
3-2 Bells - Lower Persons
3-3-1 Bells - Hoist Slowly with Caution
3-3-2 Bells - Lower Slowly with Caution
1-2-1 Bells - Hoist Muck or Materials Only
2-1-2 Bells - Release Conveyance

Team Safety

Team members must follow established procedures, per the MSHA National Contest Rules Book for the type of equipment used, when getting under oxygen.

The team captain must now check each member's apparatus. A team member must make the same checks on the captain's apparatus. The judges

will observe the operation and adjustment of the apparatuses.

The captain should see that the team line is properly stretched out and that the team members are holding or are attached to the team line.

If a team encounters smoke, an apparatus check or personnel check is required before entering smoke. In smoke, all team members must have hold of, or be fastened to, a lifeline.

The captain must now have the team count off either orally or visually by the raising of hands.

The captain must give the signal to advance. The stretcher bearers should pick up the stretchers, and the rear captain shall relay the signal to the fresh air base. When the signal is returned, the team may now advance into the mine.

Entrances to all mine openings shall be examined while under oxygen. In air clear of smoke, these checks may be made without a lifeline, provided the entire team does not go into the entrance. This examination should not cover more than twenty-five (25) feet.

For Contest purposes, a placard denoting "clear air" will mean that the atmosphere is free of smoke and all dangerous and/or harmful concentrations of flammable, combustible, noxious, and or toxic contaminants.

Teams shall never travel through water over knee deep.

Checking for loose ground (loose roof or rib) is done visually by the team captain as the team advances. The captain must verbally indicate that he is checking for loose ground at every location required. The team captain must orally warn

the team each time loose ground conditions are encountered. A similar warning must be given upon retreat.

First Team Stop

After advancing into the mine, not more than fifty (50) feet from the cage or portal, the captain shall give a signal for the team to stop. The co-captain may take no more than two steps forward after the signal before stopping. The captain now checks the members and their apparatus to see if they are in good condition and a team member checks the captain and his/her apparatus. (This check must not be made on the cage.) The procedure shall be followed at not more than twenty (20) minute intervals while the team is working the problem. Additionally, apparatus removed in order to enter a confined area or apparatus that has sustained possible damage from impact must be checked before continuing.

If all the apparatus are operating properly and the members are in good condition, the team can now continue into the mine.

The cage door must be closed and the signal to release conveyance to a standby mode must be sent after the cage has been unloaded.

Advancing

When stops are made at the openings of crosscuts, intersections, or drifts turned off the drift that is being traveled, separate gas tests must be made across each entry within 25 feet of each opening to the place turned off the entry. No place, which intersects entry direction, should be passed without first checking the condition of that place.

Examination of any intersection or entry shall not exceed 25 feet from the rear captain. This means the captain can extend out into openings and take gas readings within the limits of the team line.

In case of entries turned from the entry being traveled, it is a matter of choice which entry is to be followed and many things must be taken into consideration in making the choice. However, the openings of all places must be checked before that place is passed. A team will be considered to have passed an opening or intersection when the number 5 member is past the opening.

While advancing, if a team encounters an impassable fall or other condition that prevents the members from following the normal course of travel into an area, they may break a stopping and enter that area. If it becomes necessary to break a stopping, the team shall erect a temporary stopping or stoppings that would have the same effect on the area that the original stopping would have provided.

Doors shall not be opened without prior knowledge of the effects of the mine ventilation system, unless a temporary stopping has been erected. However, in any case, if the conditions behind the stopping or door are unknown and there is a potential that missing miners are located in the enclosed area, these ventilation controls should be treated like a “barricade” and the same precautions must be taken as prescribed in the section below.

Regulators shall not be opened without prior knowledge of the effects of the mine ventilation system, unless a temporary regulator has been erected.

Where crosscuts are blocked, no team member may advance more than three (3) feet beyond the second (2nd) intersection before tying across and/

or behind into all unexplored areas that intersect. The second intersection will be determined by two crosscuts on either side of the entry being traveled. The first intersection will be the blocked intersection. However, a team will be permitted to tie across to adjacent drifts to tie in behind.

Barricades

If a barricade is found, the team will take action to protect the barricaded persons as indicated by the conditions found outside the barricade. For the purposes of contest work, no barricade will be entered without ventilating in front of the barricade if: Oxygen (O_2) is below 17.0%; or Carbon Monoxide (CO) exceeds 1200 ppm (0.12%); or Hydrogen Sulfide (H_2S) exceeds 100 ppm (0.01%); or Nitrogen Dioxide (NO_2) exceeds 20 ppm (0.002%); or Sulfur Dioxide (SO_2) exceeds 100 ppm (0.01%); or Carbon Dioxide (CO_2) exceeds 4.0%. In the event that gases other than these are encountered or indicated by the problem, the team must ask for stain tubes or testing devices for these gases if they don't have them.

If conditions behind the barricade are unknown, the barricade cannot be opened unless the team erects a reasonably airtight temporary stopping. The space between the barricade and the temporary stopping should be as little as feasible; however, it should be large enough for the team to enter. When entering the barricaded area, the opening in the barricade should be kept to a minimum, the roof in the area shall be tested, and gas tests made.

If survivors are found, they shall be given proper respiratory protection. If more than one (1) survivor is behind the barricade and proper protection cannot

be provided for all of them, the team in retreating should keep the openings in the barricade and temporary stopping to a minimum so that as little irrespirable air will get into the barricaded area as possible. If the area beyond the last survivor can be explored without advancing the survivor, this should be done before retreating with the survivor. When all the survivors have been removed from the barricaded area, the enclosure may be opened as wide as necessary for easy exit. Survivors must be secured to the stretcher and covered with a blanket unless first aid procedures indicate other treatment is proper. If a person is found behind a barricade or in a refuge chamber and the area is not entered, the team may advance beyond the chamber for exploration. However, if survivor(s) can be safely evacuated without changing conditions, they shall be evacuated before any further exploration is done.

Dates and Initials

The date and the captain's initials must be marked at the point of farthest advance of the team in any direction such as at stoppings, faces of rooms and drifts, water over knee deep, impassable falls, barricades, fires out of control, and at the location of any survivors or bodies. The captain must verbally indicate to the judges each time initials and date are simulated.

Map and Timing Device

The map person and fresh air base attendant must use the standardized map legend provided in the Metal and Nonmetal Mine Rescue Contest Rules Book. If a symbol is not available on the legend, the team must write out the exact information contained on the placards on both maps. Teams

will be expected to accurately map all required items on the maps maintained by the team and the fresh air base attendant.

After the team has completed its 50 foot check, they will not be allowed to physically compare the team map with the fresh air base map. That is, no side by side comparison will be allowed and no changes (edits) can be made to either map while the team is at the fresh air base or out of the mine. When the team has explored all accessible areas, accounted for all miners and completed all required work, they should return to the fresh air base and count off. At that time, no other changes can be made to either map and the captain should present both maps to the person in charge of the mine and stop the timing device.

The marked maps must show: the condition of all faces, stoppings and doors; the location of all placards or materials; the location of fires and barricades; and the location of dead bodies and survivors (including identification). Temporary stoppings that are erected shall also be shown as well as the location of any gas found or indicated by placards. The maps must show all locations dated and initialed by the team captain. If a team fails to explore the entire mine, the furthest point of advance shall be indicated on the maps by a line drawn across the entry with the appropriate mine map legend symbol.

Mine Fires

When a mine rescue team encounters a non-combatible fire, indicated by "intense heat" or "fire out of control," the team shall, without undue delay, seal the fire or regulate the fire, so as to restrict the air flow to the fire and prevent

its further advance. Regulating airflow to control a fire is not considered a ventilation change. The team must then, without undue delay, find all other approaches to the fire and seal or regulate them. This does not preclude systematic exploration of the area. Whether to use regulators to control the fire or to entirely seal the fire must be decided by the team. The team must inform the official in charge prior to making any ventilation changes. This decision will take into consideration the safety of the team and any survivor(s), the classification of the mine (gassy/nongassy), the presence of any explosive gases, the possible effects of any ventilation change(s), and other pertinent data. A regulated fire, left unsealed, has the potential to emit contaminants into the mine atmosphere.

Gas Field Testing

Gas testing proficiency will be conducted during the working of the mine rescue field competition. At one or more strategic locations on the field, a gas box (gas cylinder and tubing) containing an "unknown" mixture of gases will be found by the exploring team. Each mine rescue team will need to provide their own calibration cups for their multi-gas instruments and will be expected to report all required concentrations within acceptable limits: O_2, CH_4, CO, and NO_2.

This segment of the contest will be scored by the judging officials as follows: at each gas box, there will be fifteen (15) discount points deducted per gas if the team does not report the respective gas concentration within the acceptable limits below:

a. Oxygen readings are considered to be correct if within plus or minus 1.0% by volume;

b. Methane readings are considered to be correct if within plus or minus 0.2% by volume (LEL readings are not acceptable);

c. Carbon Monoxide readings are considered to be correct if within plus or minus 20% of the actual value present; and

d. Nitrogen Dioxide readings are considered to be correct if within plus or minus 5 ppm of the actual value present.

MINE RESCUE DISCOUNTS AND INTERPRETATIONS
Surface Discount Sheet
Judge #1

Time: Hours: __ Minutes: __ Seconds: ___	**Discounts**
1. Apparatus improperly assembled, each apparatus	10 x ___ = ___
2. Apparatus improperly adjusted to the wearer, each infraction	1 x ___ = ___
3. Apparatus part or parts worn or deteriorated so as to be dangerous to wearer, each person	8 x ___ = ___
4. Failure to follow prescribed procedures for going under oxygen, each person	3 x ___ = ___
5. Failure of team member to be clean shaven in the area that affects a good face-to-facepiece seal, each infraction	10 x ___ = ___
6. Failure of captain to examine each apparatus and have captain's examined before entering the mine, each apparatus, each infraction	2 x ___ = ___
7. Team member not wearing identification, protective clothing, including safety shoes, hard hat, permissible cap lamp, self-rescuer, each infraction	2 x ___ = ___
8. Failure of team captain to mark date and team position number on the check board at mine portal or fresh air base, or start timing device, each omission	4 x ___ = ___
9. No work will be done prior to starting the clock	4 (total) ____
10. Failure of team to "count off" before entering or leaving the mine	2 x ___ = ___

_____ **Total Discounts** _____
Judge's Signature

MINE RESCUE DISCOUNTS AND INTERPRETATIONS
Surface Interpretation
Judge #1

1. Apparatus not meeting manufacturer's life critical specifications during use. This discount will be applied if the team captain or team member does not correct it before the team goes underground. Once the team has entered the course, no further penalty can be assessed by the judge.
2. Shoulder straps, chest straps, etc., that are twisted or not fastened. (Separate discount for each strap.) This discount will be applied if the team captain or team member does not correct it when the team goes under oxygen. Once the team has entered the course, no further penalty can be assessed by the judge.
3. Holes in the breathing tubes or straps worn to the extent that they break during working of the problem while still at the fresh air base; should not be discounted if they are replaced prior to starting work in the mine.
4. This will depend on type of apparatus used; the proper procedure will be outlined in the apparatus section. Once the team has entered the course, no further penalty can be assessed by the judge.
5. Self-explanatory.
6. The captain must examine the apparatus of team members and have a team member examine the captain's apparatus before entering the mine. The person making the check must obtain assurance from person being checked that he/she is all right (asking if person is okay will suffice).
7. Self explanatory.
8. Captain must mark date and team position number on check board after clock is started, and the captain must stop the clock after the maps are turned in.
9. Self-explanatory.

10. This can be done at any time after the clock is started, but must be done prior to team entering the mine for the first time. It does not have to be done prior to checking portals. Hand or audible counting off is acceptable. It is not necessary to count off upon reentry or leaving mine; however, the team is also required to count off when completing problem.

MINE RESCUE DISCOUNTS AND INTERPRETATIONS

Underground Discount Sheet

Judge #1

	Discounts
1. Breathing external air while working problem, each team member, each infraction	10 x ___ = ___
2. Team not following proper procedure in case of apparatus failure, each infraction	10 x ___ = ___
3. Failure of team to stop within 50 feet of the fresh air base or at the shaft station to perform personnel and apparatus checks, upon their first entry into the mine	4 (total) ____
4. Team member(s) not making apparatus check after removing apparatus to traverse restricted clearance or after apparatus has sustained possible damage from impact (each person, each incident)	4 x ___ = ___
5. Apparatus examination exceeding 20-minute intervals.	5 x ___ = ___
6. Failure to use posted hoisting signals, each infraction	1 x ___ = ___
7. Failure to close shaft station gate	5 x ___ = ___

8. a. Failure of the captain to indicate to the team he/she has recognized bad ground.
   b. Failure of the captain to verbally indicate he/she is checking the back or roof:
      1. at intersections, shaft stations, rooms, faces, and mine openings;
      2. at all points of farthest advance;
      3. before building or erecting any structure;
      4. upon passing through any barricade, stopping, bulkhead, air lock, door, check curtain, or similar barrier;

5. at the location of fire or intense heat.

c. Any team member performing work or moving into any part of an area during a team stop before the captain has visually checked the ground conditions in that part, each infraction 5 x ___ = ___

9. Failure of the captain to mark the date and his/her initials at the point of farthest advance of the team in any direction such as at stoppings, faces of rooms and drifts, water over knee deep, impassable falls, barricades, fires out of control, and at the location of any live persons or bodies, each omission (maximum 10 discounts) 2 x ___ = ___ (10 max.)
10. Captain or other team member doing anything to endanger himself/herself or other team members, 15 points each team member so endangered, each infraction, each occurrence 15 x ___ = ___
11. Failure of team to explore or examine workings systematically and thoroughly, each omission 4 x ___ = ___
12. Teams must be checked immediately before entering smoke 5 x ___ = ___
13. Failure to locate, seal, or extinguish fire, if possible, without undue delay 50 x ___ = ___
14. Failure to notify the fresh air base when an air/gas mixture has reached its explosive range. 10 x ___ = ___
15. Failure to bring live person to surface or fresh air base by the end of the problem, each omission 50 x ___ = ___
16. Failure to locate bodies and/or live persons, each omission 50 x ___ = ___

17. Transporting survivor in unexplored territory, leaving survivor unattended, and moving survivor in any direction except toward the fresh air base, each infraction 6 x ___ = ___
18. The team performing an act that may result in the death or injury of survivor(s). Some examples of this would be:
    a. Entering a barricade with toxic gases outside.
    b. Directing toxic gases over survivor(s) through a change in ventilation
    c. In the case of multiple survivors, leaving the higher priority patient and taking a less injured patient out, each infraction
    d. Improperly protecting survivor(s) from toxic gases 50 x ___ = ___

_____ **Total Discounts** _____
Judge's Signature

MINE RESCUE DISCOUNTS AND INTERPRETATIONS
Underground Interpretation
Judge #1

1. Working all or part of problem without a facepiece or working with inhalation hose disconnected.
2. Proper procedure would depend on type of apparatus; however, team must proceed to fresh air base immediately.
3. This check must be made: at the first stop, with all team members past the portal or off the cage (this does not apply to checking mine entrances prior to working the problem); before the captain exceeds 50 feet from portal or shaft; and before the team leaves the shaft station.
4. This apparatus check must be made as soon as all team members have passed through the restricted area and before any other work is done. Additionally, this apparatus check must be made immediately after any apparatus has sustained a blow which might cause damage to it.
5. Self-explanatory.
6. Hoist shaft signals will be posted at shaft stations and will be used to notify the hoistman of intended movement and cage release.
7. Self explanatory.
8. a. Must so indicate before any other team member passes the placard. This applies each time such a placard is reached; when retreating, the rear captain must do this.
   b. 1. Must be so indicated before physically entering the area.
      2. Includes checking in front of any physical barrier to advancement.
      3. Including erecting or breaching stoppings, barricades, curtains, etc.
      4. Must be so indicated before physically passing through.
      5. Must be so indicated immediately upon reaching the placard indicating fire or intense heat.

c. This means the captain's physical presence is necessary before any part of an area can be considered as having been examined.

9. Such places only need be marked once and also must be indicated on both maps. Date means month, day, and year.
10. Examples of endangerment include, but are not limited to:
    a. 15 points will be assessed for each team member who:
        1. travels under bad roof or ground;
        2. travels into water over knee deep;
        3. travels over or under an open ore pass or ore pocket into which they could fall or be injured by falling objects;
        4. advances past a sign indicating intense heat or fire out of control;
        5. fails to take body substance isolation (BSI) precautions before physically contacting a patient; and
        6. fails to wear apparatus while examining the entrances to mine openings.
    b. The entire team will be considered endangered and 75 points assessed for:
        1. failure to check a shaft for possible damage, or the presence of fire or flooding, prior to traveling through it. For contest purposes, this check may be done by placing combustible materials on the cage and having the cage lowered to the level to be explored, then raising it to the collar.
        2. not having non-sparking tools in a gassy mine or when explosive gases are found in a non-gassy mine.
        3. changing conditions of the mine ventilation system in such a manner that an explosive mixture is moved over an ignition source. Changing conditions of the mine ventilation system in such a manner that an explosive mixture is moved over an unexplored area. If a

team explores all sides of an overcast or an undercast, both ends of a ventilation shaft, or the top and bottom of shafts when the shaft cannot be traveled, the in-between areas are considered explored for ventilation purposes.

4. continuing exploration after conditions are found to indicate an imminent explosion is possible by the presence of an explosive mixture and the evidence of fire (smoke or carbon monoxide) and the location of the fire is unknown. A team must continue to explore if it knows there is a continuous nonexplosive separation between the explosive mixture and the evidence of fire.
5. utilizing electric or battery-powered equipment in explosive air/gas atmosphere. Ignition sources would include any communication device, unless designated as sound-powered or intrinsically safe.
6. failure to take a functioning wire communication system into the mine or committing an act that causes the communications system to break or fail while underground.

11. This will be assessed for not exploring all areas of the mine that can be explored without endangering team, if problem requires entire mine to be explored. All accessible areas must be tied across and behind before advancing. Where crosscuts are blocked, no team member may advance more than three (3) feet beyond the second intersection before tying across and/or behind into all unexplored areas that intersect. This may require building an air lock or returning to the fresh air base and exploring into other drifts at the discretion of the team and according to conditions of the mine. Shafts must be checked for possible damage, water, or fire, and must be traveled to be considered explored. All shafts must be traveled, if possible, before proceeding more than three (3) feet beyond the second intersection.

12. Personnel checks, not necessarily an apparatus check. The person making the check must obtain assurance from person being checked that he/she is all right (asking if person is okay will suffice).
13. Sealing or fighting a fire does not relieve the team of the responsibility of systematic exploration.
14. Failure to notify the fresh air base when an air/gas mixture, which reached its explosive range, has been encountered.
15. Self-explanatory.
16. Self-explanatory.
17. If a person is found behind a barricade or in a refuge chamber in a contaminated area, and the barricade or refuge chamber is not entered, the team may advance.
18. An act which does not endanger the team, but may injure or result in the death of a survivor.

MINE RESCUE DISCOUNTS AND INTERPRETATIONS
Surface Discount Sheet
Judge #2

	Discounts
1. Failure to take necessary permissible equipment and gas detecting devices to work the problem, each omission	4 x ___ = ___
2. Gas detectors, testers, and/or indicators failing to function properly and not corrected before entering the mine, each infraction	4 x ___ = ___
3. Testers or detectors improperly assembled or defective parts used	8 (total) ____
4. Failure to secure extra apparatus to stretcher, each omission	4 x ___ = ___
5. Physically comparing team map with fresh air base map, once the team has entered the mine.	100 (total) ____
6. Failure of the team to complete the problem within the established time limit.	100 (total) ____
7. Any team whose member(s) intentionally disturb or destroy any component on a competition field will immediately be assessed this discount. Repeated offense may result in team disqualification at the discretion of the contest director.	100 (total) ____

_____ **Total Discounts** _____
Judge's Signature

MINE RESCUE DISCOUNTS AND INTERPRETATIONS
Surface Interpretation
Judge #2

1. Failure to take necessary permissible equipment or testing devices underground, discount should be assessed even if teams return to fresh air base to pick up necessary equipment.
2. Faulty or inadequate equipment must be repaired or replaced. (This includes instruments used beyond their designed limits or range.)
3. If any questions exist, the equipment should be checked by the judges after the completion of the problem in the presence of the team captain.
4. Extra apparatus must be secured to stretcher to prevent it from falling off.
5. Teams may place reference or other information on both maps before proceeding into the mine. After the team has completed its 50 foot check, no side by side comparison of the maps or changes (edits) will be allowed on either map while the team is at the fresh air base.
6. Teams are required to complete the problem in the established time limit: explore all accessible areas of the mine; extinguish or seal all fires; locate all missing miners; and bring all survivors to the surface.
7. Self-explanatory.

MINE RESCUE DISCOUNTS AND INTERPRETATIONS
Underground Discount Sheet
Judge #2

	Discounts
1. Failure to make necessary gas tests where required, each gas, each omission	1 x ___ = ____
2. Improper procedure when testing with gas detectors, each gas, each infraction	1 x ___ = ____
3. Intentional causing of a test instrument to inflate faster than tests indicate that it should, each infraction	1 x ___ = ____
4. At each gas box on the field, the team must stop and take a measurement and report the respective gas concentrations within the acceptable limits below (each gas box, each occurrence):	
a. Oxygen (O_2) readings are considered to be correct if within plus or minus 1.0% by volume;	15 x ___ = ___
b. Methane (CH_4) readings are considered to be correct if within plus or minus 0.2% by volume;	15 x ___ = ___
c. Carbon Monoxide (CO) readings are considered to be correct if within plus or minus 20% of the actual value present; and	15 x ___ = ___
d. Nitrogen Dioxide (NO_2) readings are considered to be correct if within plus or minus 5 ppm of the actual value present.	15 x ___ = ___
5. Less than 5 members entering, working or completing problem, each person	8 x ___ = ___
6. Traveling at more than a normal walking speed	8 (total) ____

7. Team member talking to an unauthorized person without permission of the judges or contest officials, each infraction 5 x ___ = ___
8. Intentionally detaching/severing lifeline 5 (total) ____
9. All team members must be connected or have hold of the lifeline when the team is traveling or when in smoke. When stopped, in clear air, at least one person must have hold of the life line. If tag lines are used between team members and the team line, they shall be no longer than 3 feet in length. 2 x ___ = ___
10. Failure to erect temporary barricade, stopping or regulator when necessary, each infraction 10 x ___ = ___
11. Failure to erect temporary barricade, seal, or stopping reasonably airtight, each infraction 2 x ___ = ___
12. Failure to make necessary ventilation changes or changing ventilation or electric power before the effects of such changes are known, each infraction 15 x ___ = ___
13. Failure to properly secure survivor to stretcher; failure to cover survivor with blanket (unless first aid procedures indicate otherwise); or placing survivor on stretcher in such a way as to foul proper operation of apparatus, each omission 4 x ___ = ___
14. Survivor care:
    a. Failure to adequately examine and assess each person found in the mine for possible injury or illness, each infraction 4 x ___ = ___

b. Failure to properly treat any injury or illness which is, or should have been, revealed by the examination, each infraction 4 x ___ = ___

15. Failure to follow proper procedure when putting apparatus on survivor, each infraction 5 x ___ = ___
16. Assistance given by supposedly unconscious person, each infraction 5 x ___ = ___

_____ **Total Discounts** _____
Judge's Signature

MINE RESCUE DISCOUNTS AND INTERPRETATIONS
Underground Interpretation
Judge #2

1. Tests for gases must be made at face areas, stoppings, doors, regulators, barricades and other areas where conditions are unknown. When stops are made at the openings of crosscuts, intersections, or drifts turned off the drift that is being traveled, separate gas tests must be made across each entry within 25 feet of the rear captain's position. No place shall be passed without first checking the condition of that place. That is, if a room is turned from the entry, that room shall be checked before examining the entry beyond the opening. This does not necessarily hold true in cases of entries. In cases of entries turned from the entry being traveled, it is a matter of choice which entry is to be followed and many things must be taken into consideration in making the choice. However, all places must be checked before that place is passed. A team will be considered to have passed an opening or intersection when the No. 5 member is past the opening. All areas that have been cleared of smoke and toxic or dangerous gases that the teams elect to travel through must be rechecked prior to the team's reentering. Upon re-entry into these areas where the ventilation has been changed, teams shall make gas tests at all openings along the route they travel.
2. This will depend on type of instrument used. Improper procedure when testing includes the location of the instrument when testing or using a gas detection device beyond its limits or range. For example, a methane detector must be held overhead when testing because methane (CH_4) is light and will be found in high places near the back or roof. Nitrogen dioxide (NO_2) is relatively heavy and will be found in greater concentrations along the floor and in low places. Therefore, this test must be made with the tester below the waist. Carbon monoxide (CO) is slightly lighter than air so this test must be made at chest height.

3. Self-explanatory.
4. Self-explanatory.
5. This does not apply to checking mine entrances prior to working the problem.
6. Teams traveling obviously faster than a normal walk (both judges must concur on this) shall be discounted.
7. Do not hesitate to assess this discount; however, explain and name unauthorized person on discount card and state instructions given, if known.
8. Self-explanatory.
9. The No. 5 member may move from side to side to give captain more area when team is connected by lifeline in smoke or by communication line as long as he/she does not pull or give line. All team members must hold or be attached to the lifeline at all times while traveling. If taglines are used between team members and the team line, they shall be no longer than 3 feet in length.
10. Stoppings, doors, regulators, and barricades require construction of temporary stoppings by a team before a team may make openings in the pre-existing stoppings, doors, etc. Doors shall not be opened without prior knowledge of the effects of the mine ventilation system, unless a temporary stopping has been erected. Regulators shall not be opened without prior knowledge of the effects of the mine ventilation system, unless a temporary regulator has been erected. This does not apply to existing check curtains used to direct the air current. When retreating out of a barricade or coming back through a stopping where an air lock has been erected, it will not be necessary to air lock on the way out, if this will not change any existing ventilation.
11. During a ventilation change, a curtain that directs airflow is required to be upgraded to a temporary barricade, seal, or stopping and must be fastened at top and sides.
12. Teams must inform the official in charge before changing the ventilation or electric power, and such things as explosive gases and the safety

of trapped miners and rescue personnel must be considered. Teams do not have to exit the mine to change power or ventilation. Teams can inform the fresh air base attendant by approved communication devices available, and the fresh air base attendant must inform the official in charge before changing ventilation or electric power. Informing the official in charge of the fresh air base does not relieve the team of the responsibility of their decision.

13. Survivor must be secured to stretcher by at least two bandages or straps, one around trunk of body and one around legs, covered with blanket, and placed so as not to crimp air hoses (hands of unconscious person must be secured).
14. a. This will be based on the Brady First Responder, Eighth Edition, Chapters: 4, 5, 6, 7, 8, 9, 10, and 11, and MSHA Publication 3027 (IG 6) - Module 6, Rescue of Survivors and Recovery of Bodies. (This book may be ordered from the National Mine Health and Safety Academy. See page 12.)
    b. A team must deal with a victim(s), if there is either visual or verbal contact or if the rescue can be done without violating procedures. Visual contact requires the captain's presence in the area. Verbal contact is any voice communication from the victim that can reasonably be expected to be heard by the team.
15. Among other things, using an auxiliary self-contained breathing apparatus or self-rescuer on a live person instead of an approved 4-hour self-contained breathing apparatus is a failure to properly protect that survivor.
16. Applies to person sitting up unassisted or moving arms so as to help in putting on apparatus (only applies if person is member of the team and not an MSHA employee).

NATIONAL MINE RESCUE CONTEST
Team Discount Summary Sheet

Team No.:_____

Company Name: _____

Team Name: _____

Judge #1 Surface: _____

Underground: _____

Judge #2 Surface: _____

Underground: _____

Written Test: _____

Map: _____

Working Time: Hours: ____ Minutes: ____ Seconds: ____

Total Discounts
Excluding average time: _____

Time Review Completed: _____

I certify that I have read and reviewed all discounts listed above.

_____ _____

Team Captain Review Judge

NATIONAL MINE RESCUE CONTEST
Written Examination Discount Summary Sheet

Company Name: _____

Team Name: _____

Draw Number: _____

Discounts

For each incorrect answer for each person
(1 discount)

No. 1 person	1 x ____ = _____
No. 2 person	1 x ____ = _____
No. 3 person	1 x ____ = _____
No. 4 person	1 x ____ = _____
No. 5 person	1 x ____ = _____
No. 6 person (substitute)	1 x ____ = _____

_____ **Total Discounts** _____
Judge's Signature

NATIONAL MINE RESCUE CONTEST
Map Discount Summary Sheet

Company Name: _____

Team Name: _____

Draw Number: _____

Team Map:

1. Failure to record information on map 1 x ___ = ___
2. Not recording information accurately on map (within 6 feet of actual location measured from the center point of the object), each infraction 1 x ___ = ___

Fresh Air Base Map:

1. Failure to record information on map 1 x ___ = ___
2. Not recording information accurately on map (within 6 feet of actual location measured from the center point of the object), each infraction 1 x ___ = ___

_____ **Total Discounts** _____
Map Examiner's Signature

NATIONAL MINE RESCUE CONTEST
Time Discount Summary Sheet

Company Name: _____

Team Name: _____

Draw Number: _____

Total Time

Total time will be rounded off to the next highest minute. (Total average time will also be rounded off to the next highest minute.) _____

Discounts

For each minute over average time. ½ x ___ = ____

_____ **Total Discounts** _____
Timekeeper's Signature

TECHNICIAN TEAM CONTEST

GENERAL RULES

1. The Technician Team Competition will be held in a simulated mine rescue station and may consist of benching at least one self-contained breathing apparatus and at least one multi-gas instrument, and preparing the first aid supplies and general mine rescue equipment to ensure the field readiness of the team. Thus, with this practical approach at the conclusion of the competition, the technician team's mine rescue team will be prepared to go underground and conduct a successful mine rescue mission.
2. The technician team will consist of two members of the 8-person mine rescue team. Persons competing in the Technician Team Competition cannot be members of the first aid team.
3. Registration will be made with the team registration.
4. The Technician Team competition will be held at designated locations and times over a two-day period opposite of the preliminary Mine Rescue Field competition. All written tests will be conducted at the same time in isolation. Contestants will remain in isolation until they finish the Technician Team Competition or they will be disqualified.
5. For the purposes of identification, participants of the Technician Team Competition must be dressed uniformly, complete with team logo and team member number.
6. At the beginning of the competition, the technician team will be presented with a scenario which requires their mine rescue team's services. After the team verifies that they understand the gravity of the situation, the clock will be started. The technician team may work together or separately to complete the required tasks.
7. At the simulated mine rescue station, the technician team will be provided with at least one breathing apparatus and at least one multi-gas

instrument (designated by each team at the time of registration), equipment, tools, and supplies, as necessary to complete the problem. Only those tools, equipment, and supplies provided will be used by contestants to work the problem. It is imperative that each team provide the type and model of breathing apparatus and the type and model of multi-gas instrument that the team will be using during the field competition because the same type and model of breathing apparatuses and multi-gas instruments will be made available to the Technician Team at the "simulated mine rescue station" during the Technician Team competition.

8. Forty (40) minutes will be allowed to complete the competition. There will be a five (5) minute warning given by the judge when the time is about to expire. If the technician team has not completed the competition when time expires, the judges will stop their activities. They will be scored based on their discounts to that point, including: appropriate discounts for items missed; and appropriate discounts for necessary actions not taken by the technician team to complete the assigned task.
9. If the problem is not completed in the specified time, an additional twenty-five (25) discounts will be assessed.
10. All defects in testing and preparation will result in the appropriate discounts.
11. ... WARNING ... Any team whose member(s) intentionally disturb or destroy any component on a competition field will immediately be assessed a 100 point discount. Repeated offense may result in team disqualification at the discretion of the contest director.
12. The combined total discounts of the written tests and the individual segments of the competition will determine the winner. In the event of a tie, the written test scores will determine the winner. The total time will be the second tie-breaker.
13. At a pre-designated time after the competition, the judges will conduct a five-minute review of all

discounts. After the review, both the judges and the technician team will sign the appropriate judge's scorecard in the spaces provided. All appeals must be in writing and submitted within 30 minutes of the conclusion of the five-minute review. The contest appeals committee ruling will be final.

14. There will be a total of six trophies awarded for the Technician Team Contest.

WRITTEN TEST

1. The written test will be given in conjunction with the written tests for the Mine Rescue Field competition and the First Aid competition. A total of 60 minutes will be allowed to complete all required testing. At the end of the allotted time, tests will be collected regardless of whether or not the contestants have answered all of the required questions.
2. The written test will be given while the contestants are in isolation and will consist of thirty (30) multiple choice and true/false questions. The questions will be taken from:
   a. MSHA Publication 3027 (formerly "IG 6 – Instructor's Manual for Mine Rescue Training"): Module 2 – Mine Gases and Module 3 – Ventilation.
   b. MSHA National Mine Rescue Contest Rules
   c. Respective instrument and apparatus manufacturers' service or operations manuals, handbooks, and videos.
3. Each written test will include ten (10) questions concerning the breathing apparatus and (10) questions concerning the multi-gas instrument used by the Technician Team's mine rescue team, as declared on the contest registration form. The test questions will be taken from the manufacturer's current published information for each unit.
4. Contestants will be assessed one (1) discount point for each incorrect or unanswered question. Any alterations to the test questions or answers will be determined to be incorrect by the test judge and discounts assessed.

5. Scoring of the test will be completed by at least two qualified judges.
6. In special circumstances, individual team members may be given an oral test by one or more judges in lieu of a written test. Requests for consideration shall be presented to the Contest Director at the time of registration. All other team members will take the test at the same time. In any case, the judges will not explain the meaning of questions, but may explain a word or words in the questions.

JUDGING

1. All judges will be trained as prescribed by the Contest Director.
2. Judges must stand clear of team members.
3. Prior to the competition, judges will ensure that the team's breathing apparatus(es), multi-gas instrument(s), and first aid supplies and mine rescue equipment contains only the deficiencies as per the planned problem.
4. When unplanned deficiencies are encountered, judges will stop the clock, instruct the technician team to turn their backs to their respective area, at which time the judge will correct the unplanned deficiencies. Judges shall instruct the technician team that upon turning back to their area, the clock will restart. If the deficiencies are caused by either team member, the clock will not be stopped.

APPEALS

1. After the 40-minute time limit expires, the technician team will be notified to report to the area designated for 10-minute looks. The team will have 10 minutes for reviewing the judges' scorecards and written test scores. A discount summary sheet will be used to list the discounts. All discounts will be listed and totaled. Both the technician team and the review judges will sign the discount sheet to certify they have reviewed the discounts and verified the totals (see page 87). After the completion of the

review, the technician team will have an additional 30 minutes to prepare and submit any appeals. All appeals must be in writing and must clearly state the team's comments to the discount in question.
2. All appeals will be considered by the Technician Team Appeals Committee and their decision will be binding and final.

DISCOUNTS

1. Discounts will not be added to the technician team score once the judges have signed their discount sheets following a review with team members. This does not preclude changes due to administrative errors or a misapplication of a rule.
2. Technician Teams will not be discounted more than once for any one mistake in the same segment of the competition where such mistake may qualify under more than one discount. Judges will confer and assess the highest single discount.

TECHNICIAN TEAM CONTEST
TEAM EQUIPMENT CHECKS/PREPARATION

GENERAL RULES

1. The technician team must make necessary checks of multi-gas instruments (see Multi-Gas Instrument Checks/Problem Diagnosis) and self-contained breathing apparatuses (see Apparatus Checks/ Problem Diagnosis) for proper working condition. These checks must be within the manufacturer's specified limits. The extra breathing apparatus must also be tested accordingly.
2. The technician team must check the portable communication system to ensure that it works properly and has insulated wire strong enough to give and receive manual signals in the event of failure.
3. The technician team must also check the available mine rescue equipment and supplies, such as lifeline, scaling bars, stretchers, hammers, blankets, first aid supplies, fire extinguishers, etc., to ensure that they are adequate to meet the requirements of the problem and that they are in functional condition. Fire extinguishers need not be activated and stretchers do not have to be subjected to a weight-bearing test — visual inspections will suffice. If horns are to be used for signaling between team members, they should be checked. For contest purposes, a one minute seal check simulating 10 minutes will be sufficient for the pump-type multi gas detector. The Technician Team will be allowed to bring a copy of the list of "suggested first aid supplies" when it is their turn to work the problem.
4. Faulty equipment must be repaired or replaced. If replacements or replacement parts are not available, these items can be requested from the respective judges.
5. If the information provided indicates that explosive gas(es) is/are or may be present in the mine, the technician team must ensure that non sparking tools are available for their team.

SUGGESTED FIRST AID SUPPLIES

The following list of first aid supplies is provided as a guide for the technician teams. It is not meant to be an all-inclusive list. It does, however, reflect the minimum supplies needed to adequately stock the basket for the mine rescue team preparation. It does not necessarily include what an Emergency Medical Technician (EMT) team or even a competition first aid team need carry.

Personal Safety/CPR

- 10 pair Gloves
- 2 pair Safety Goggles
- 2 CPR Microshields or pocket masks
- 12 alcohol preps or sanitizer (1 bottle)

Minor Cuts and Scrapes

- 20 Adhesive bandages
- 10 Butterfly Bandages
- 20 - 2x2 Gauze Pads
- 2 Tongue Blades/Finger Splints
- 1 Roll Plastic Medical Tape, 1 inch

Larger Injuries/Trauma

- 1 - Pair Trauma Shears
- 2 - 5x9 Dressings
- 25 - 4x4 Gauze Pads (2 packs)
- 4 Gauze Rolls, 3 inch
- 6 Triangular Bandages
- 1 Elastic Bandage, 2 inch
- 1 Mylar Survival Blanket
- 1 Set of 5 Oral Airways
- 1 Stethoscope
- 1 Blood Pressure Cuff
- 2 Instant Cold Packs, large
- 1 Regular Blanket
- 1 Eye Protector (paper cup or cone)
- 6 eye pads
- 1 Occlusive dressing (for airtight seals)
- 1 C-Collar (Adjustable for all sizes)

- Various upper and lower extremity splints
- Sand Bags or Head immobilizer
- 4 burn sheets
- Ammonia inhalants (1 pack)
- Eye wash (2 bottles)
- 4- 8x10 pads

TECHNICIAN TEAM CONTEST
TEAM EQUIPMENT CHECKS/PREPARATION
Judges' Scorecard

	Discounts
1. Failure to provide necessary equipment or supplies for the team to work the problem, each omission	5 x ___ = ____
2. Failure to repair or replace defective equipment, each infraction	5 x ___ = ____
3. Failure to check and repair, if necessary, the communications system	10 (total) ____
4. Failure to provide or request non-sparking tools, if required	75 (total) ____
5. Failure to complete the problem within the time limit.	25 (total) ____
6. Any team whose member(s) intentionally disturb or destroy any component on a competition field will immediately be assessed this discount. Repeated offense may result in team disqualification at the discretion of the contest director.	100 (total) ____

Total Discounts _____

_____
Judge's Signature

TECHNICIAN TEAM DISCOUNTS AND INTERPRETATIONS
TEAM EQUIPMENT CHECKS/PREPARATION

1. At the conclusion of the competition, the technician team's mine rescue team must be prepared to go underground and conduct a successful mine rescue mission. The Technician Team must check the available mine rescue equipment and supplies, such as lifeline, scaling bars, stretchers, hammers, blankets, first aid supplies, fire extinguishers, etc., to ensure that they are adequate to meet the requirements of the problem and that they are in functional condition. If the scenario requires additional equipment or supplies, the technician(s) must request these items.
2. All faulty equipment must be repaired or replaced. If replacements or replacement parts are not available, these items can be requested from the respective judges.
3. Self-explanatory.
4. If the information provided indicates that explosive gas(es) is/are or may be present in the mine, the technician team must ensure that non sparking tools are available for their team.
5. Self-explanatory.
6. Self-explanatory.

TECHNICIAN TEAM CONTEST
MULTI-GAS INSTRUMENT CHECKS/PROBLEM DIAGNOSIS

GENERAL RULES

1. The technician team must be familiar with the respective multi-gas instrument manufacturer's operations manual, handbook, and/or video.
2. For the purposes of the 2012 National Metal and Nonmetal Mine Rescue Contest, multi-gas instruments used by the teams (designated by each team at the time of registration) do not necessarily need to meet the requirements of 30 CFR 49.16(a)(6). That is, the multi-gas instruments used by the teams during the 2010 National Metal and Nonmetal Mine Rescue Contest will be allowable for use in each phase of the 2012 competition, including the Field and Team Technician competitions.
3. The multi-gas instrument given to the technician team may have multiple bugs or problems consisting of any of the following:
   a. Missing and/or needed sensors
   b. Failed sensors
   c. Mis-calibrated sensors
   d. Dead or incorrect batteries
   e. Incorrect alarm and calibration points
   f. Missing parts
4. The technician team will be expected to evaluate the instrument(s), repair all of the deficiencies, properly calibrate or functional (bump) test the instrument(s), and check for proper action level alarm set points. Dependent on the scenario provided, the technician team may be required to reconfigure the instrument(s) to measure appropriate gases, properly calibrate the instrument(s), and check/set proper action level alarm set points. Proper action level alarm set points and configuration settings for these gases will be provided by the judges.
5. The technician team may return to correct any uncorrected deficiencies at any time within the time limit.

6. Five (5) discount points per alarm point will be assessed for any incorrectly set alarms.
7. Five (5) discount points will be assessed for each instance of incorrect procedure or equipment use during calibration.
8. No discounts will be assessed for replacing non-deficient sensors, as long as the resulting calibration(s) and alarm points are correct.
9. For completion, the instrument(s) must be fully assembled, operating, and properly configured within the allowed time. The multi-gas instrument(s) must be placed on the stretcher within the allotted time. If the team technician does not leave the instrument(s) in this "ready-for-use" condition, a five (5) point discount will be assessed.

TECHNICIAN TEAM CONTEST
MULTI-GAS INSTRUMENT CHECKS/PROBLEM DIAGNOSIS
Judges' Scorecard

Technician Team: _____
Company Name: _____
Team Name: _____
Draw Number: _____
Instrument Model _____ Serial # _____

Bench Problem

Sensor		Alarm Points Reqd.	Set	Comments	Discounts
O_2	Low	19.5	_____	_____	_____
	High	23.5	_____	_____	_____
	Procedure		_____		_____
CH_4	Low	1.0	_____	_____	_____
	High	1.5	_____	_____	_____
	Procedure		_____		_____
CO	Low	50	_____	_____	_____
	High	100	_____	_____	_____
	Procedure		_____		_____
NO_2	Low	3.0	_____	_____	_____
	High	5.0	_____	_____	_____
	Procedure		_____		_____
Toxic:					
____	Low	___	_____	_____	_____
	High	___	_____	_____	_____
	Procedure		_____		_____

Additional Discounts:

Functional (Bump) Test Not Performed, if required - 5 discounts, each infraction _____
Multi-gas Instrument(s) not "ready for use" - 5 discounts (total) _____
_____ _____
_____ _____
_____ _____
_____ _____
_____ _____
_____ _____

Judge _____ **Total discounts:** _____
Judge _____

TECHNICIAN TEAM CONTEST
APPARATUS CHECKS/PROBLEM DIAGNOSIS

GENERAL RULES

1. The technician team must be familiar with the respective self-contained breathing apparatus manufacturer's service manual.
2. The technician team will be provided with at least one fully assembled self-contained breathing apparatus, an apparatus tester, defogging solution, leak detector fluid, and all parts necessary to complete the problem. Only tools, apparatus, and testing equipment provided by the judge will be used by the technician team to work the problem. Bugs used in the competition will be consistent with all models of breathing apparatuses.
3. Checks must be performed in order as prescribed by the manufacturer and recorded. If and when deficiencies are encountered, the technician team must call out to the judge and properly correct and record any and all deficiencies. Visuals can be performed at any time.
4. The technician team may return to correct any uncorrected deficiencies within the time limit.
5. If the technician team performs checks out of order, there will be a one-time discount of five (5) points assessed.
6. The technician team will be allowed to move forward, in order, in the event a deficiency is detected but not located. Once deficiency is corrected, the technician team must return to the point of deficiency and repeat all test steps in proper order.
7. If checks are performed incorrectly, checks will be discounted as not performed.
8. Fifteen (15) discounts will be assessed for each deficiency not found.
9. Five (5) discounts will be assessed for each deficiency not corrected.
10. Five (5) discounts will be assessed for each monthly check not performed.

11. Sucking or blowing on valves with one's mouth while making checks is prohibited. There will be a ten (10) point discount assessed for each infraction.
12. For completion, the self-contained breathing apparatuses must be assembled with hoses connected to the face piece and attached to the apparatus. The spare apparatus must be secured to the stretcher within the allotted time. If the team technician does not leave the apparatuses in this "ready-for-use" condition, a five (5) point discount will be assessed. This rule addressing "ready for use" criteria is self-explanatory and specific. Contestants must ensure that all apparatuses found at the "simulated mine rescue stations" are left in this condition before the forty (40) minute time limit expires. Any deviation or omission will result in a five (5) point discount.
13. All breathing apparatuses at the "simulated mine rescue station" must be examined in order to determine when they received their last monthly checks. Those units which have documentation (e.g., on a tag, on a piece of paper, or in a log book) showing the monthly checks were conducted within the past 30 days must still undergo a "high pressure leak test."

TECHNICIAN TEAM CONTEST
DRAEGER BG-4 BREATHING APPARATUS

TECHNICIAN TEAM CONTEST
DRAEGER BG-4 BREATHING APPARATUS
CHECKS/PROBLEM DIAGNOSIS
Judges' Working Scorecard

Apparatus Serial #	
Test Date	
Visual Inspection	
Low Pressure Alarm (Negative Pressure Warning)	
Inhalation Valve	
Exhalation Valve	
Drain Valve	
Positive Pressure Leak	
Relief Valve	
Constant Metering (Dosage)	
Minimum Valve	
Bypass Valve	
Residual Warning	
Battery Check	
Test OK (initials)	
Replacement Parts	
Ready for Use	

Team No. _____

Technician(s) _____

Company _____

	Corrected
Bug	_____
Bug	_____
Bug	_____
Bug	_____
Bug	_____
Bug	_____

Summary of Discounts

Required check not performed:
5 discounts x _____ = _____

Checks out of order:
5 discounts (total) _____

Deficiency (bug) not found:
15 discounts x _____ = _____

Deficiency (bug) not corrected:
5 discounts x _____ = _____

Sucking/Blowing Valves:
10 discounts x _____ = _____

Apparatuses not "Ready for Use": 5 discounts (total)

_____

Total Discounts _____

Judge _____

Judge _____

TECHNICIAN TEAM CONTEST
BENCHMAN'S CONTEST - DRAEGER BG-4
CHECKS/PROBLEM DIAGNOSIS
Technician Team's Blank Testing Card

Team No. _____

Technician(s) _____

Company _____

Problems Found
Corrected

Bug _____

Bug _____

Bug _____

Bug _____

Bug _____

Bug _____

TESTING PROCEDURE
DRAEGER BG-4 BREATHING APPARATUS

STEP	TESTER SETTING	PROCEDURE HINTS
1. Visual Inspection	------	Check for good condition.
2. Insert O_2 Cylinder	------	Fully Charged.
3. Insert Canister	------	Factory Sealed or Reusable.
4. Facepiece and Hoses	------	Check for good condition.
5. Low Pressure Warning	Pos. Pres. Pumping	Watch pressure gauge, activation should sound at 1.25 and/or 1.4 mbar.
6. Inhalation Valve	Pos. Pres. Pumping	Pinch exhalation hose - 10 mbar indicated on gauge.
7. Exhalation Valve	Neg. Pres. Pumping	Pinch inhalation hose - 10 mbar indicated on gauge.
8. Drain Valve	Pos. Pres. Pumping	Pump until 10 mbar is indicated on gauge. Fit sealing cap over tappet of relief valve as bag inflated. Drain valve must not open at 10 mbar.
9. Leak Test	Leak Test	Reduce Pres. to 7 mbar pressure should not change by more than 1 mbar in 1 minute.
10. Relief Valve	Pos. Pres. Pumping	Pump until relief valve opens. Opening pressure should lie between 2 & 5 mbar.

(Alternate Relief Valve Test, can be performed after Step 13.)

STEP	TESTER SETTING	PROCEDURE HINTS
11. Constant Metering	Pos. Pres. Pumping	Open O_2 cylinder. Inflate breathing bag. Fit sealing cap over tappet of relief valve.
	Dosage .05 - 2 L/min	Constant metering dosage should lie between 1.5 and 1.9 L/min.
12. Minimum Valve	Neg. Pres. Pumping	Pump slowly until minimum valve is opening. Minimum Valve should open between 0.1 and 2.5 mbar.
13. Bypass Valve	Leak Test	Press red button. Breathing bag inflates.
(Alternate Relief Valve Test)		Observe reading on Rz, relief valve should open between 2 and 5 mbar.
14.	Low Pressure Warning	Close cylinder valve. Warning sounds at 700 psi.
15.	Battery Check	If Failing: Alarm sounds 5 times. Red indicator flashes for 30 sec. **Bat** is displayed.

(Note – Battery check is performed when shutting off the sentinel by observing the indicator. Black battery is sufficient, battery indicator with "1" indicates four (4) hours left on battery, and "2" means change battery immediately.)

PROCEDURES FOR "HIGH PRESSURE LEAK TEST"

For the Draeger BG-4 with Monitron (CCr/OCr Test):

a. The oxygen cylinder must be full, i.e. the charging pressure must be greater than 2600 psi/165 bar.
b. Open the oxygen cylinder valve. CCr (Close Cylinder) will appear on the display unit approximately 3 seconds after opening the cylinder valve and successful completion of the battery test.
c. As soon as the display disappears: close the cylinder valve.
d. After approximately 35 seconds if the apparatus is O.K.:
    i. Alarm sounds once
    ii. Green indicator flashes
    iii. OCr (Open Cylinder) is displayed, i.e. open cylinder valve.
e. The high-pressure leak test has been completed successfully.
    i. Keep cylinder valve closed.
    The "automatic battery test" is performed, before switching off.
f. Afterward, attach the face piece to the hoses and the unit is now in a "ready to use" condition.

For the Draeger BG-4 with Sentinel:

a. The oxygen cylinder must be charged to at least 2600 psi, otherwise the Sentinel will not carry out the test.
b. Open the oxygen cylinder valve. The icon "Close cylinder valve" appears on the display, the backlight is on, and a double alarm beep sounds when the pressure is greater than 2600 psi/165 bar.
c. Close the cylinder valve.
d. After 15 seconds when the BG-4 is O.K.:
The icon "Open cylinder valve" appears on the display, the backlight is on, and the countdown process of the bar graph continues.
The high pressure leak test has been passed successfully.

e. Keep the cylinder valve closed.
   Remove the sealing cap. Wait until the Sentinel shows 0 psi/0bar pressure.
f. Replace the sealing cap on the plug-in coupling.
g. Switching off the Sentinel
   i. Simultaneously press the right and the left hand button until a sharp audible “bleep” sounds.
   ii. Release buttons.
   iii. For 3 seconds the Sentinel shows the battery status.
   iv. Sentinel switches off.
h. Afterward, attach the face piece to the hoses and the unit is now in a “ready to use” condition.

PROCEDURES FOR GETTING UNDER OXYGEN
DRAEGER BG-4 BREATHING APPARATUS

Procedures for getting under oxygen:

1. Prior to donning the apparatus, make sure a filled cylinder, a fresh soda lime pack, and an ice block for the breathing air cooler are installed. Don the apparatus and adjust the harness and belt.
2. Don the facepiece by spreading the head harness with hands; put chin into chin support and pull harness over the head. Tighten the chin straps first, then the temple straps, and then the top head strap. The facepiece must be sufficiently tight on the face to prevent leakage of the breathing air which could shorten the duration of the apparatus.
3. Open cylinder valve fully.
4. Check the digital pressure gauge to see that a sufficient oxygen supply remains. The green LED light should be displayed. Press the by-pass valve to check the by-pass valve operation.
5. Check the facepiece tightness by tightly closing both breathing hoses and inhaling. The facepiece should collapse against the face, indicating there are no leaks.
6. Each team member and apparatus should be rechecked by the team captain. The team captain and apparatus should be rechecked by a team member.

Items to be checked prior to going underground and at 20 minute intervals:

1. Visually check apparatus.
2. Check pressure gauge.
3. Question member as to member's ability to continue.

TECHNICIAN TEAM CONTEST
BIOMARINE BIOPAK 240R/240S
BREATHING APPARATUS

TECHNICIAN TEAM CONTEST
BIOMARINE CHECKS/PROBLEM DIAGNOSIS
BIOPAK 240R
Judges' Working Scorecard

Apparatus Serial #	
Test Date	
Visual Inspection	
Constant Flow Test 1.6 – 2.4	
Low Pressure Leak Test	
RMS Guage & TRIM System Check	
Plumbing High Pressure Leak Test	
Ready for Use	

Team No. _____

Technician(s) _____

Company _____

	Corrected
Bug	_____
Bug	_____
Bug	_____
Bug	_____
Bug	_____
Bug	_____

Summary of Discounts

Required check not performed:
5 discounts x _____ = _____

Checks out of order:
5 discounts (total) _____

Deficiency (bug) not found:
15 discounts x _____ = _____

Deficiency (bug) not corrected:
5 discounts x _____ = _____

Sucking/Blowing Valves:
10 discounts x _____ = _____

Apparatuses not "Ready for Use":
5 discounts (total) _____

Total Discounts _____

Judge _____

Judge _____

TECHNICIAN TEAM CONTEST
BIOMARINE CHECKS/PROBLEM DIAGNOSIS
BIOPAK 240S
Judges' Working Scorecard

Apparatus Serial #	
Test Date	
Visual Inspection	
Plumbing Leak Test	
Constant Flow Test 1.6 – 2.4	
Breathing System Leak Test	
Ready for Use	

Team No. _____

Technician(s) _____

Company _____

	Corrected
Bug	_____
Bug	_____
Bug	_____
Bug	_____
Bug	_____
Bug	_____

Summary of Discounts

Required check not performed:
5 discounts x _____ = _____

Checks out of order:
5 discounts (total) _____

Deficiency (bug) not found:
15 discounts x _____ = _____

Deficiency (bug) not corrected:
5 discounts x _____ = _____

Sucking/Blowing Valves:
10 discounts x _____ = _____

Apparatuses not "Ready for Use":
5 discounts (total) _____

Total Discounts _____

Judge _____

Judge _____

TECHNICIAN TEAM CONTEST
BIOMARINE CHECKS/PROBLEM DIAGNOSIS
BIOPAK 240R/240S
Technician Team's Blank Testing Card

TEST PROCEDURES	

Team No. _____

Technician(s) _____

Company _____

Problems Found
Corrected

Bug _____

Bug _____

Bug _____

Bug _____

Bug _____

Bug _____

TESTING PROCEDURE
BIOMARINE BIOPAK 240R
BREATHING APPARATUS

STEP	EQUIPMENT	PROCEDURE HINTS
1. Visual Inspection	------	Visually inspect the entire BioPak 240R for worn, loose or missing parts, and parts that could fail under use.
2. Constant Flow Test	Flow Meter	Attach the flow meter on to the constant flow line. Open O_2 cylinder valve. Flow should be 1.6 – 2.4 LPM. (+10% at elevations above 2000 ft)
3. Low Pressure Leak Test	Leak Test Kit/Gauge Two Test Keys	Connect leak test kit/ gauge to hoses Insert two pressure test keys into the holes in the back of the unit and turn ¼ turn to lock in place. Open O_2 cylinder valve, depress by-pass to inflate chamber. Close cylinder valve. Depress by-pass to vent internal pressure. Vent pressure at test fixture until leak test kit/ gauge reaches 6" - 8" water column. Time for one minute, maximum .2" drop.
4. RMS Gauge & TRIM System Check	Gauge/TRIM RMS	Open oxygen cylinder and observe gauge and TRIM. Listen for alarm horn, observe light sequence (Red, Green, Blue) and verify flashing Green.
5. Plumbing High Pressure Leak Test	Leak Tec	Install fully charged oxygen cylinder. Open O_2 cylinder valve. Check each plumbing joint with Leak Tec.

TESTING PROCEDURE
BIOMARINE BIOPAK 240S
BREATHING APPARATUS

STEP	EQUIPMENT	PROCEDURE HINTS
1. Visual Inspection	------	Visually inspect the entire BioPak 240S for worn, loose or missing parts, and parts that could fail under use.
2. Plumbing High Pressure Leak Test	Tongue Depressor Leak Tec	Install fully charged cylinder (minimum 2,700 psi). Remove breathing chamber lid and CO_2 scrubber. Hold diaphragm away from demand valve with tongue depressor. Open O_2 cylinder valve. Check each plumbing joint with Leak Tec.
3. Constant Flow Test	Tongue Depressor Flow Meter	Slip the flowmeter over the flow restrictor. Hold diaphragm away from demand valve with tongue depressor. Open O_2 cylinder valve. Flow should be 1.6 – 2.4 LPM. (+10% at elevations above 2,000 feet)
4. Breathing System Leak Test	Leak Test Fixture Pressure Test Knob	Connect leak test fixture to hoses. Insert pressure test key into the hole in the back of the unit and turn ¼ turn to lock in place. Open O_2 cylinder valve, depress by-pass to inflate balloon. Close cylinder valve, depress by-pass to vent internal pressure.

Vent pressure at test fixture until balloon reaches approximately 45 degree.

Time for two minutes looking for significant drop in balloon pressure.

PROCEDURES FOR "HIGH PRESSURE LEAK TEST"

For the BioPak 240 R:

a. Hold the pneumatic gauge in one hand and turn the unit by opening the oxygen cylinder. Verify that the pressure gauge reads between 2700 and 3000 psi.
b. Observe gauge and TRIM light sequence, listen for Horn. When the 240 R RMS finishes its battery test and horn test and then flashes green, the contestant may then turn off the oxygen cylinder and bleed the unit by depressing the bypass. This takes approximately 50-60 seconds to do this test due to the gauge line flow restrictor.
c. A successful test is one in which: 1) Oxygen does not leak out of the regulator; 2) Guage goes to flow; 3) Proper RMS light sequence which ends up with a green light; and 4) Horn goes on and off.
d. Bleed the unit properly by depressing the bypass.
e. Afterward, attach the face piece to the hoses and the unit is now in a "ready to use" condition.

For the BioPak 240S:

a. Hold the pressure gauge in one hand and turn on the unit by opening the oxygen cylinder. Verify that the pressure gauge reads between 2700 and 3000 psi.
b. Observe gauge and listen for whistle. When the gauge reaches full (it takes a BioPak 240S gauge to reach full in 50-60 seconds due to the gauge in flow restrictor) and the contestant hears the whistle, he/she is then OK to turn off the oxygen cylinder and bleed the unit by properly depressing the bypass.
c. A successful test is one in which: 1) Oxygen does not leak out of the regulator when the cylinder is opened; 2) Gauge goes to full; and 3) Whistle goes on and off.
d. Bleed the unit properly by depressing the bypass.
e. Afterward, attach the face piece to the hoses and the unit is now in a "ready to use" condition.

PROCEDURES FOR GETTING UNDER OXYGEN BIOMARINE BIOPAK 240R BREATHING APPARATUS

Procedures for getting under oxygen:

Pre-Use Inspection

1. If apparatus is stored in a ready to use condition, Turn-Around Maintenance Tag attached to harness (date less than one year old). Before donning the apparatus install frozen Ice Canisters, wet sponges, secure lid.
2. If apparatus is not stored in a ready to use condition, prior to donning the apparatus, complete the Turn Around maintenance procedures as outline in the BioPak 240R Benchman Instruction Manual, Revision I, wet sponges and install the CO_2 absorbent cartridges (Cartridges dated within three years). Install a frozen Coolant Canister, secure lid.

Donning, Getting under Oxygen

1. Don the apparatus, tighten shoulder straps, buckle and adjust waist strap, connect and adjust chest strap.
2. Attach facemask to hose adapter and lock in place.
3. Place facemask harness over head, center chin in chin cup, hold facemask to face and snug bottom (chin) straps first, then the upper (temple) straps, and then the top (head) strap (if supplied). A poor facemask seal will cause a significant decrease in duration.
4. Perform negative pressure check by collapsing the inhalation hose and inhaling. If the mask collapses in on your face mask fit is good and exhalation valve is OK.
5. Perform positive pressure check by collapsing the exhalation hose and exhaling. If the mask pushes away from face, mask fit is good and inhalation valve is OK.
6. Completely open the oxygen cylinder all the way.
7. Inspect Chest gauge minimum 3000 psi and TRIM flashing Green.

8. The team captain should recheck each team member and apparatus. A team member should recheck the team captain and apparatus.

Items to be checked before going underground and at 20-minute intervals.

1. Visually check apparatus.
2. Check chest mounted pressure gauge.
3. Question member as to member's ability to continue.

PROCEDURES FOR GETTING UNDER OXYGEN BIOMARINE BIOPAK 240S BREATHING APPARATUS

Procedures for getting under oxygen:

Pre-Use Inspection

1. If apparatus is stored in a ready to use condition, Turn-Around Maintenance Tag attached to oxygen cylinder valve (date less than one year old). Before donning the apparatus install frozen Gel Tube Insert into cooling canister, secure lid.
2. If apparatus is not stored in a ready to use condition, prior to donning the apparatus, complete the periodic long term maintenance procedures as outline in the BioPak 240S Benchman Instruction Manual, Revision K. Fill and install the CO_2 absorbent canister (LimePak dated within one year). Install a frozen Gel Tube Insert into cooling canister, secure lid.

Donning, Getting under Oxygen

1. Don the apparatus, tighten shoulder straps, buckle and adjust waist strap, connect and adjust chest strap.
2. Place facemask harness over head, center chin in chin cup, hold facemask to face and snug bottom (chin) straps first, then the upper (temple) straps, and then the top (head) strap. A poor facemask seal will cause a significant decrease in duration.
3. Perform negative pressure check by blocking the inhalation port with hand and inhaling. If the mask collapses in on your face, mask fit is good and exhalation valve is OK.
4. Perform positive pressure check by covering the exhalation port with hand and exhaling. If mask pushes away from face; mask fit is good and inhalation valve is OK.
5. Remove hose coupler; connect inhalation hose and then exhalation hose to mask. Open oxygen cylinder valve fully counterclockwise and back ¼ turn. Note whistle chirp.

Option: If hoses are connected to the facepiece prior to donning.

a. Don facemask as outlined above (item 2).
b. Open cylinder valve fully counterclockwise and back 1/4 turn. Note whistle chirp.
c. Perform negative pressure check by pinching off the inhalation hose and inhaling. If the mask collapses in on your face, mask fit is good and exhalation valve is OK.
d. Perform positive pressure check pinching off the exhalation hose and exhaling. If mask pushes away from face, mask fit is good and inhalation valve is OK.

6. Check chest-mounted pressure gauge, 2700 - 3000 psi within one minute.
7. The team captain should recheck each team member and apparatus. A team member should recheck the team captain and apparatus.

Items to be checked before going underground and at 20-minute intervals.

1. Visually check apparatus.
2. Check chest mounted pressure gauge.
3. Question member as to member's ability to continue.

TECHNICIAN TEAM CONTEST
Discount Summary Sheet

Team No.: _____

Company Name: _____

Technician Team: _____

Team Equipment Checks/Preparation

Discounts: _____

Multi-Gas Instrument Checks/Problem Diagnosis

Discounts: _____

Apparatus Checks/Problem Diagnosis

Discounts: _____

Written Test

Discounts: _____

Total Discounts: _____

Time to Complete Problem: _____

Time Review Completed: _____

I certify that I have read and reviewed all discounts listed above.

_____ _____
Technician Review Judge

_____ _____
Technician Review Judge

NATIONAL METAL AND NONMETAL FIRST AID CONTEST

GENERAL RULES

1. The First Aid team must furnish the basic first aid supplies needed to complete the problem unless specified by the contest coordinator that the supplies will be available at a specific station.
2. All material used to solve the first aid problem will be picked up by the team prior to moving on to their next prospective station.
3. Cardiopulmonary Resuscitation (CPR) and abdominal thrusts will only be performed on a manikin.
4. Any violations of the general rules not covered in the discount sheets will result in ten (10) discounts for each infraction.
5. Team members must wear an approved protective hat, identification tag, safety shoes, permissible cap lamps, self-rescuer, and safety glasses.
6. ... WARNING ... Any team whose member(s) intentionally disturb or destroy any component on a competition field will immediately be assessed a 100 point discount. Repeated offense may result in team disqualification at the discretion of the contest director.

GUIDELINES AND PROCEDURES

1. The First Aid Contest will consist of first aid problems and a written examination.
2. One first aid team will be allowed to compete for each mine rescue team entered in the Mine Rescue Contest.
3. The first aid team will consist of three members of the mine rescue team.
4. All first aid team members will attend a briefing while in isolation and will remain in isolation until their team name is called.
5. If participating teams need additional help, such as transporting or moving a patient, help will be provided by contest officials.

6. There will be a minimum of two (2) judges at each of the first aid stations.
7. Judges will be assigned specific tasks to be scored prior to the judging and will record their findings on a specific scoring card issued prior to the contest.
8. Judges must be current in first aid methods and knowledgeable in the station they will be judging.
9. There will be two (2) separate first aid stations (not necessarily in any order).
    a. Foreign body obstructed airway-unconscious victim, artificial respiration, CPR.
    b. Patient assessment, control of bleeding, physical shock, wounds, burns, scalds, musculoskeletal injuries, and transportation.
10. When the team receives the first aid scenario the clock will be started.
11. Judges must keep an accurate time and record it on scoring sheets for tie breaker purposes. First tie breaker will be field scores on all stations, second tie breaker will be scores on written test, and third tie breaker will be total time on field scores.
12. Judges will not discuss any first aid problem with contestant teams unless there are technical problems.
13. Only judges, contest officials, escorted photographers, and news media approved by the contest director will be permitted in the first aid stations.
14. On the day prior to the contest, a meeting will be held to discuss officials' and judges' assignments and training. All personnel who will be officiating during the contest shall attend this meeting.
15. The Eighth Edition of Brady "First Responder," Chapters: 4, 5, 6, 7, 8, 9, 10, and 11, the published rules, and the interpretations of the discount sheets are authorized for reference and guidance.
16. The team will not be permitted to use first aid manuals for reference purposes during the problem solving or between working stations.
17. If oxygen is required in the treatment of a patient, it may be simulated with the use of a mask. No oxygen tank will be required.

18. There will be no simulations on the patient. All dressings and splints must be placed properly.
19. Team members are not allowed to leave the working area to obtain materials for the problem.
20. Stimulants will not be given to any patient.
21. When digital pressure is applied to the proper pressure point, bleeding will be considered under control and acknowledged by the judge.
22. Rough treatment of patient is not allowed.
23. If a tourniquet is required in First Aid problem, do not secure tightly.
24. Assistance in treatment from a supposedly unconscious patient is not allowed.
25. Teams failing to complete problems at station 2 in the specified time will be discounted.
26. The winning six teams will be announced during the banquet.
27. Following the awarding of the trophies and plaques, team rankings will be available to the teams. The results from each station of the contest will be given to the teams at the earliest possible time.

WRITTEN TEST

1. The written test will be given in conjunction with the written tests for the Mine Rescue (field competition) and Technician Team contests. A total of 60 minutes will be allowed to complete all required testing. At the end of the allotted time, tests will be collected regardless of whether or not the contestants have answered all of the required questions.
2. The written test will be given while the contestants are in isolation and will consist of **thirty (30)** true/false and multiple choice questions. The questions will be taken from the **Eighth** Edition of Brady "First Responder", Chapters: 4, 5, 6, 7, 8, 9, 10, and 11. The contestants will be assessed one (1) discount point for each incorrect or unanswered question. Any alterations to the test questions or answers will

be determined to be incorrect by the test judge and discounts assessed.

3. Scoring of the test will be completed by at least two qualified judges.
4. In special circumstances, individual team members may be given an oral exam by one or more judges in lieu of a written exam. Requests for consideration shall be presented to the Contest Director at the time of registration. All other team members will take the test at the same time. **In any case, the judges will not explain the meaning of questions, but may explain a word or words in the questions.**

APPEALS

1. Upon completion of the examination of the patient by the judges at each station, the team will be informed of any infractions regarding treatment while at the station. The team will be permitted to verbally appeal any infractions either with the field judge or the chief judge. If not resolved, the chief judge will make the final decision until an appeal can be filed by the team.
2. During the verbal appeal process, all questionable splints/dressings must remain intact until the appeal is resolved. If any questionable splints/dressings are removed or altered by the team prior to being resolved, the appeal will not be allowed.
3. Teams will have 15 minutes after being notified to report to the area designated for 20-minute looks. The team will have 20 minutes for reviewing the judges' scorecards and an additional 30 minutes to prepare and submit any appeals. All appeals must be in writing and must clearly state the team's comments to the discount in question. All appeals will be considered by the First Aid Appeals Committee and their decision will be binding and final.

DISCOUNTS

1. Discounts will not be added to the team score once the judges have signed their discount sheets following a review with team members. This does not preclude changes due to administrative errors or a misapplication of a rule.
2. Teams will not be discounted more than once for any one mistake in the same problem where such mistake may qualify under more than one discount. Judges will confer and assess the highest single discount.
3. Teams will be additionally discounted for repetition of the same mistakes in the same problem. For example; improper bandaging on two separate wounds (2 times the appropriate discount), three granny knots (3 times the appropriate discount), etc.
4. Teams will not be discounted for doing more than the problem calls for, unless it is detrimental to the patient or improper care.
5. If the discount is not listed on the discount sheet and if it is not covered under one of the approved rules of the contest, judges will not improvise a discount to cover the suspected violation

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METAL AND NONMETAL FIRST AID CONTEST
Judges' Discount Card

Station #1

Cardiopulmonary Resuscitation (CPR)
Artificial Respiration
Foreign Body Obstructed Airway - Unconscious Victim

Team Name: _____ Team Number: _____

Team Members: Captain _____

_____

_____

Date: _____

A. One Rescuer CPR (In accordance with the 2005 American Heart Association Health Care Provider Guidelines)	**Discounts**
1. Not checking accident scene to assure personal safety	5 x ___ = ___
2. Not taking body substance isolation (BSI) precautions (glasses, gloves, and CPR barrier)	15 x ___ = ___
3. Not determining unresponsiveness	1 x ___ = ___
4. Not calling for help	1 x ___ = ___
5. Not opening airway	2 x ___ = ___
6. Using head-tilt/chin lift maneuver when modified jaw thrust should be used	2 x ___ = ___
7. Not assessing breathlessness	1 x ___ = ___
a. Assessing breathlessness should take no longer than 10 seconds (time begins when the rescuer looks, listens, and feels for breathing)	1 x ___ = ___
8. Not giving two breaths initially	1 x ___ = ___
a. Not giving two breaths within 3-4 seconds	1 x ___ = ___
b. Not inflating lungs adequately	1 x ___ = ___
c. Not allowing for deflation between breaths	1 x ___ = ___

	Discounts
9. Not repositioning head when airway obstruction is found	1 x ___ = ___
10. Not giving two breaths between compressions	1 x ___ = ___
a. Not giving two breaths within 3-4 seconds	1 x ___ = ___
b. Not inflating lungs adequately	1 x ___ = ___
c. Not allowing for deflation between breaths	1 x ___ = ___
11. Not checking for pulse	1 x ___ = ___
12. Improperly checking for pulse	
a. Assessing pulse should take no longer than 10 seconds (time begins when the rescuer feels for a pulse)	1 x ___ = ___
13. Not using "notch" or "nipple line" technique for proper hand position	1 x ___ = ___
14. Not making parallel axis with heels of hands	1 x ___ = ___
15. Not completing five sets of 30 compressions and 2 ventilations within 2 minutes of initiating CPR.	
a. Depth of compressions not between 1.5 to 2 inches	5 x ___ = ___
b. Not releasing compressions	1 x ___ = ___
16. Incorrect hand position	1 x ___ = ___
17. No pulse reassessment	1 x ___ = ___
18. Not beginning compressions after reassessment (when required)	1 x ___ = ___
19. Interrupting CPR for more than 7 seconds (each)	1 x ___ = ___
20. Not giving artificial ventilation when pulse is found	4 x ___ = ___
21. Not communicating and physically examining each condition found (each)	1 x ___ = ___

One Rescuer CPR **Subtotal** _____

B. Artificial Respiration	**Discounts**
1. Not checking accident scene to assure personal safety	5 x ___ = ___
2. Not taking body substance isolation (BSI) precautions (glasses, gloves, and CPR barrier)	15 x ___ = ___
3. Not determining responsiveness	1 x ___ = ___
4. Not calling for help	1 x ___ = ___
5. Not opening airway	2 x ___ = ___
6. Using head-tilt/chin lift maneuver when modified jaw thrust should be used	2 x ___ = ___
7. Not assessing breathlessness	1 x ___ = ___
a. Assessing breathlessness should take no longer than 10 seconds (time begins when the rescuer looks, listens, and feels for breathing)	1 x ___ = ___
8. Not giving two breaths initially	1 x ___ = ___
a. Not giving two breaths within 3-4 seconds	1 x ___ = ___
b. Not inflating lungs adequately	1 x ___ = ___
c. Not allowing for deflation between breaths	1 x ___ = ___
9. Not repositioning head when airway obstruction is found	1 x ___ = ___
10. Not checking for pulse	1 x ___ = ___
11. Not giving artificial ventilation when pulse is found	4 x ___ = ___
12. Improper timing of artificial ventilations (12 to 15 per minute)	2 x ___ = ___
13. Not rechecking pulse after one minute of artificial respirations	2 x ___ = ___
14. Not communicating and physically examining each condition found (each)	1 x ___ = ___

Artificial Respiration **Subtotal** _____

C. Foreign Body Obstructed Airway – Unconscious Victim **Discounts**

1. Not checking accident scene to assure personal safety 5 x ___ = ___
2. Not taking body substance isolation (BSI) precautions (glasses, gloves and CPR barrier) 15 x ___ = ___
3. Not determining unresponsiveness 1 x ___ = ___
4. Not calling for help 1 x ___ = ___
5. Not opening airway 2 x ___ = ___
6. Using head-tilt/chin-lift maneuver when modified jaw thrust should be used 2 x ___ = ___
7. Not assessing breathlessness 1 x ___ = ___
   a. Assessing breathlessness should take no longer than 10 seconds (time begins when the rescuer looks, listens and feels for breathing) 1 x ___ = ___
8. Not giving 2 breaths initially 1 x ___ = ___
9. Not repositioning head after initial ventilation attempt fails 2 x ___ = ___
10. Not using tongue-jaw lift, cross finger technique or finger sweep when required (each) 1 x ___ = ___
11. Not giving abdominal or chest thrust when required 2 x ___ = ___
12. Improper number (maximum of 5) or improper technique in administering abdominal or chest thrusts (off to one side, improper hand position) 2 x ___ = ___
13. Not attempting to ventilate after each series of abdominal or chest thrusts 2 x ___ = ___
14. Not assessing for breathlessness or pulse once obstruction is cleared 2 x ___ = ___

	Discounts
15. Not giving artificial ventilation/ CPR when airway has been cleared, if necessary	4 x ___ = ___
16. Not communicating and physically examining each condition found (each)	1 x ___ = ___

Foreign Body Obstructed Airway – Unconscious Victim **Subtotal** _____

Station #1 **Total Discounts** _____

_____
Judge

_____
Judge

_____
Scorecard Examiner

METAL AND NONMETAL FIRST AID CONTEST
JUDGES' DISCOUNT CARD

Station #2
Patient Assessment
Control of Bleeding
Physical Shock
Wounds, Burns and Scalds
Musculoskeletal Injuries
Transportation

Team Name: _____ Team Number: _____

Team Members: Captain _____

_____

_____

Date: _____ Time to Complete Problem _____

A. Patient Assessment

Primary Assessment	**Discounts**
1. Not checking accident scene to ensure personal safety	5 x ___ = ___
2. Not taking body substance isolation (BSI) precautions (glasses, gloves and CPR barrier)	15 x ___ = ___
3. Not administering patient assessment	25 x ___ = ___
4. Not checking unresponsiveness	1 x ___ = ___
5. Not calling for help	1 x ___ = ___
6. Not stabilizing head if spinal injury is suspected	2 x ___ = ___
7. Not placing patient in supine position	1 x ___ = ___
8. Improper turning of patient	5 x ___ = ___
9. Not assessing airway – using head-tilt/chin-lift maneuver when modified jaw-thrust should be used and visa versa	10 x ___ = ___

	Discounts
10. Not removing visible foreign substance from mouth	2 x ___ = ___
11. Not assessing breathing - look, listen, feel	10 x ___ = ___
12. Not checking for pulse	10 x ___ = ___
13. Improperly checking for a pulse	2 x ___ = ___
14. Not visibly checking for profuse bleeding - state to judge that you are looking for bleeding	10 x ___ = ___
15. Not doing primary assessment in proper sequence	15 x ___ = ___

Secondary Assessment

16. Not examining head (scalp, blood in hair, etc.)	2 x ___ = ___
17. Not examining neck	2 x ___ = ___
18. Raising head if spinal injury exists	6 x ___ = ___
19. Not checking chest (placing hand on chest)	2 x ___ = ___
20. Not gently feeling abdominal area	2 x ___ = ___
21. Not gently feeling under patient (lower back) for injury	2 x ___ = ___
22. Not checking pelvic area for injury	2 x ___ = ___
23. Not checking genital area for obvious injury	2 x ___ = ___
24. Not checking lower extremities for injury	2 x ___ = ___
25. Not checking lower extremities for paralysis	2 x ___ = ___
26. Not checking upper extremities for injury	2 x ___ = ___
27. Not checking upper extremities for paralysis	2 x ___ = ___
28. Not checking back surfaces for injury	2 x ___ = ___
29. Not checking medic alert bracelets/necklace	2 x ___ = ___

	Discounts
30. Checking out of order	15 x ___ = ___
31. Work other than taking support or controlling bleeding during secondary survey	4 x ___ = ___

Patient Assessment **Subtotal** _____

B. Control of Bleeding **Discounts**

1. Not controlling arterial bleeding	20 x ___ = ___
2. Not applying direct pressure to control arterial bleeding	20 x ___ = ___
3. Ineffective indirect pressure (off pressure point, etc.)	4 x ___ = ___
4. Releasing direct or indirect pressure or elevation before bleeding is controlled	4 x ___ = ___
5. Tourniquet - Ineffective application, improperly applied or loosened during problem	4 x ___ = ___
6. Applying tourniquets when not required	4 x ___ = ___
7. Not giving any treatment for internal bleeding	4 x ___ = ___
8. Bandages improperly applied (not entirely covered, wrong location, method, or position of knot, etc.)	2 x ___ = ___

Control of Bleeding **Subtotal** _____

C. Physical Shock **Discounts**

1. Not loosening tight clothing at neck, chest, and waistline, if closed (unopened belt, button, snap, or fastener) (each infraction)	1 x ___ = ___
2. Not covering patient	2 x ___ = ___
3. Improper covering of patient	1 x ___ = ___

	Discounts
4. Giving patient a stimulant	4 x ___ = ___
5. Not elevating foot end or head end of stretcher in required cases	1 x ___ = ___
6. Not keeping calm and not assuring the patient (emotional well being)	2 x ___ = ___

Physical Shock **Subtotal** _____

D. Wounds, Burns and Scalds	**Discounts**
1. Not applying dressing for wound or burn (each)	8 x ___ = ___
2. Not applying cover dressing	4 x ___ = ___
3. Not using sterile gauze or sterile dressing	1 x ___ = ___
4. Bandages improperly applied (not entirely covered, wrong location, method, or position of knot, etc.)	2 x ___ = ___
5. Failure to place gauze between fingers, toes, or back of ear (when required)	2 x ___ = ___
6. Failure to apply cold applications or elevate bruise (when practical) (each)	2 x ___ = ___
7. Not removing or indicating removal of clothing from affected area	2 x ___ = ___
8. Not rendering any treatment for rupture	6 x ___ = ___
9. Not simulating or indicating that gauze is moist (when required)	2 x ___ = ___
10. Failure to properly treat sucking chest wound	10 x ___ = ___
11. Not treating injuries in their proper order (according to fundamentals)	4 x ___ = ___
12. Improperly applied slings when required (each)	1 x ___ = ___

Wounds, Burns and Scalds **Subtotal** _____

E. Musculoskeletal Injuries	**Discounts**
1. Not rendering any treatment for a strain or sprain (each infraction)	4 x ___ = ___
2. Not treating suspected spinal injury, fracture of pelvis or thigh (each) (this includes not using a properly sized cervical collar)	12 x ___ = ___
3. Not treating fractures other than (#4) (each)	10 x ___ = ___
4. Failure to properly treat suspected skull fracture	2 x ___ = ___
5. Failure to support fractures/dislocations until properly splinted	6 x ___ = ___
6. Not properly treating dislocations (each)	8 x ___ = ___
7. Failure to properly splint	2 x ___ = ___
8. Failure to properly apply padding where needed	1 x ___ = ___
9. Lifting or rolling patient from wrong side when applying splint	2 x ___ = ___
10. Improperly lifting or rolling of patient (lifting to knee when patient has dislocated or fractured hip or spinal injury)	2 x ___ = ___
11. Improperly assembled splint/backboard	2 x ___ = ___
12. Improperly applied bandages	2 x ___ = ___
13. Improperly applied slings when required (each)	1 x ___ = ___

Musculoskeletal Injuries **Subtotal** _____

F. Preparation for Transportation **Discounts**

1. Lifting patient from wrong side (three members on least injured side) 2 x ___ = ___
2. Patient not placed on stretcher when required 2 x ___ = ___
3. Improperly applied basket sling 1 x ___ = ___

Preparation for Transportation Subtotal _____

1. Failure to locate and treat any condition (each infraction) 10 x ___ = ___
2. Not completing problem in specified time 25 (total) ____
3. Any team whose member(s) intentionally disturb or destroy any component on a competition field will immediately be assessed this discount. Repeated offense may result in team disqualification at the discretion of the contest director. 100 (total) _____

Station #2 **Total Discounts** _____

_____
Judge

_____
Judge

_____
Scorecard Examiner

GLOSSARY OF TERMS

ACCESSIBLE - Able to be traveled into; not impassable.

ADIT - A nearly horizontal passage from the surface by which a mine is entered.

AIR LOCK - An area in the mine closed at both ends by two doors or two bulkheads. An air lock is used to prevent mixing of different atmospheres while still permitting miners to enter and exit.

AIR SHAFT - Shaft used exclusively for conducting air.

AIR SPLIT - The division of an air current into two or more parts.

AIR TRACK DRILL - A heavy drill mounted on crawler tracks.

AIRWAY - Any passage through which air is flowing.

ALTERNATE - Person qualifying to participate as a mine rescue team member. Can replace any team member who cannot continue or who is removed from the problem.

ASSISTANT - Optional seventh person who may assist the fresh air base attendant but is not eligible to substitute for another team member including the fresh air base attendant.

ATMOSPHERIC PRESSURE -Force exerted by air. Atmospheric pressure is measured on a barometer.

AUXILIARY FAN - A small, portable fan used to supplement the ventilation of an individual working place.

AUXILIARY VENTILATION - Portion of main ventilating current directed to face of dead-end entry by means of an auxiliary fan and tubing.

BACK FILL - The rough material used to refill a place from which the earth has been removed.

BACK/ROOF - That part of an opening which is nearest the surface in relation to any portion of the workings of the mine, the roof. Overhead surface of an underground opening.

BACKUP TEAM - The rescue team stationed at the fresh air base as a "backup" for the working team beyond the fresh air base.

BAFFLE - A device used to deflect, check or regulate the flow of air.

BARRICADE - Enclosed part of mine to prevent inflow of noxious gases from a mine fire or explosion. This may be done by doors or by building one or more airtight walls using any available materials such as rock, wood, brattice cloth, mud, clothing, etc., so as to enclose a maximum quantity of good air. If contact is not made with person behind the barricade, conditions inside the barricade will be unknown.

BARRICADING - Enclosing part of mine to prevent inflow of noxious gases from a mine fire or an explosion.

BATTERY LOCOMOTIVE - Battery powered machine used for moving cars within the mine.

BATTERY CHARGING STATION - Area set aside for charging and storing batteries.

BATTERY OPERATED EQUIPMENT – Any equipment powered by batteries.

BELT FEEDER - The dump end of a belt system. To disperse ore on the belt.

BLASTING BOX - The unit used for firing of one or more charges electrically.

BLASTING CAPS - A detonator containing a charge of detonating compound, which is ignited by electrical current or the spark of a fuse used for detonating explosives.

BOREHOLE - Any deep or long drill hole. It may be a source of air, supplies and communications in an emergency.

BORER - A device for making large holes.

BRATTICE CLOTH - Fire-resistant fabric or plastic used in a mine passage to control ventilation.

BRIEFING -Session held before a team goes underground to inform team members of conditions underground and give them their work assignment.

BULKHEAD - A wall or partition constructed across a passageway to direct the ventilating air in its proper course.

BUMP TEST - A functional test, defined as a brief exposure of the monitor to a concentration of gas(es) in excess of the lowest alarm set-point for each sensor for the purpose of verifying sensor and

alarm operation and is not intended to be a measure of the accuracy of the instrument.

CAGE - A shaft conveyance used in hoisting personnel and materials.

CAVED - Ground which has fallen.

CAVED IMPASSABLE - Incapable of being passed, traveled, crossed, or surmounted, but allows some ventilation flow.

CAVED TIGHT - Ground caved in to prevent access and allows no ventilation flow.

CHOCKS - Wedge shaped blocks to put under vehicle wheels to prevent movement.

CHUTE/ORE PASS - Vertical or inclined passageway for downward movement of ore.

CLEAR AIR - An atmosphere which is free of smoke and all dangerous and/or harmful concentrations of flammable, combustible, noxious, and or toxic contaminants.

CONTINUOUS MINER - A mining machine designed to remove ore from the face and load it into cars or conveyors.

CRIB BLOCKS - Blocks used for support.

CROSSCUT - A horizontal opening driven across the direction of the main workings; a connection between the two drifts or tunnels.

CURTAIN - Brattice cloth, canvas or plastic curtain used to deflect or direct air into a working place. Constructed in a manner to allow the passage of miners and machinery.

CUTTING MACHINE - A power (electric) driven machine used to undercut ore.

DEBRIEFING - Session held when teams return to the surface after completing an assignment to review what they saw and did.

DETONATING FUSE - A round, flexible cord containing a center core of high explosives (Primacord).

DETONATOR - A device used for detonating explosives.

DISTRIBUTION BOX - An enclosure through which electric power is carried to one or more cables from a single incoming feed line.

DOWNCAST - An opening though which fresh ventilating air is drawn or forced into the mine; the intake.

DRIFT/ENTRY - A passage underground

EXHAUST - The air course along which the air of the mine is returned or conducted to the surface.

FACE/RIB - Vertical surface of an underground opening.

FEEDER - Small cracks in rock strata from which gas escapes.

FILL - Any material that is put back in place of the extracted ore.

FLOOR - That part of any underground opening upon which one walks.

FOOTWALL - Lower side of a dipping ore body.

FRESH AIR BASE - Base of operations from which the rescue and recovery teams can advance into irrespirable atmospheres.

FRONT-END LOADER - Self-propelled machine used for moving or loading muck.

HANGING WALL - Upper side of a dipping ore body.

HOLE CHARGED - A drilled hole that is charged with explosives ready to be blasted.

IMPASSABLE - Incapable of being passed, traveled, crossed, or surmounted.

INACCESSIBLE AREAS - All areas of the mine where team travel is blocked by one of the following conditions: seals, unsafe roof (rib-to-rib) that cannot be supported or scaled, inextinguishable fires, water over knee deep, caved impassable falls, or the top of an overcast.

INCLINE/SLOPE - A non-vertical shaft, usually on the dip of a vein.

INTAKE - The passage through which fresh air is drawn or forced into a mine.

INTENSE HEAT - Air heated to the extent that it cannot be entered.

INTERSECTION - For contest work, any area driven 3 feet or more off a drift.

LAGGING - Materials used for flooring or shoring.

LEAD WIRE - Wire used to fire electric detonators.

LIFELINE - Rope, line, or cable that links the team to the fresh air base.

LINE BRATTICE - Fire-resistant fabric or plastic partition used in a mine passage to direct the air into the working place. Also termed "Line Canvas or Line Curtain."

LOADING MACHINE - A machine to load broken ore or rock.

LONG HOLE DRILL - A drill using sectional steel to drill holes to greater depths.

LOOSE BACK - Unstable overhead surface which must be controlled before entry.

LOOSE RIB - Unsupported loose ground on the side of the drift.

MAGAZINE - A storage place for explosives or for detonators.

MANDOOR - Door installed in a permanent stopping (bulkhead) to allow persons to travel from one drift to another.

MANHOLE - A refuge hole constructed in the side of a drift.

MANTRIP - A trip on which personnel are transported to and from a work area.

MINE DOOR - A large, hinged door used to close off a mine entry.

MISFIRE - The complete or partial failure of a blasting charge to explode as planned.

MOTOR - Machine usually on a track used for tramming ore or supplies.

MULTI-GAS INSTRUMENT - Gas detector capable of continuously and simultaneously measuring atmospheric concentrations of oxygen (O_2), methane (CH_4), carbon monoxide (CO) and at least one other toxic gas (e.g. nitrogen dioxide -NO_2).

ORE PASS - A vertical or inclined passage for the downward transfer of ore.

OVERCAST - Enclosed airway built at an intersection of mine passages that permits one air current to pass over another air current without mixing.

PERMISSIBLE - A machine, material, apparatus or device which has been investigated, tested and approved by MSHA for use in gassy mines.

PILLAR - A column of ore or rock left in place.

POST - A mine timber.

RAISE - A vertical or inclined opening driven upward.

RAISE CLIMBER - Equipment used in an opening (raise) that is mined upward.

REFUGE CHAMBER - An airtight, fire-resistant room in a mine used as a method of refuge in emergencies by miners unable to reach the surface.

REGULATOR - An adjustable door or opening in a stopping, used to control and adjust the quantity of airflow.

RETURN AIR - The air that has passed through the working areas of the mine.

RIB - The wall of a mine opening.

ROOF BOLTER - A machine designed to drill holes in the roof and install bolts.

ROOF BOLTS/ROCK BOLTS - A long bolt inserted and anchored in holes drilled in the rock.

ROOF JACKS - A roof support designed for immediate temporary use.

SCALING BAR - Tool with a flat point and a heel used to pry in a crack of the rock.

SEAL - A stopping built of greater thickness and more substantial construction used to isolate abandoned areas of the mine from the active workings or to isolate a fire.

SHAFT - A vertical opening of limited area compared with its depth, made for finding or mining ore, raising ore, rock or water, hoisting and lowering workers and materials, or ventilating underground workings.

SKIP - A hoisting bucket, which slides between guides in a shaft.

SLUSHER/SCRAPER - A machine for transferring or loading rock by pulling an open bottomed scoop back and forth from the face to the loading point by means of a drum hoist, cables and sheaves.

SPLIT - To divide the air current in two or more separate currents.

STOPE - An excavation in a mine, other than development workings, made for the purpose of extracting ore.

STOPER - A pneumatic hammer drill used for drilling upward.

STOPPING - A permanent or temporary wall or partition constructed across a passageway to direct the ventilating air.

STULL/PROP - Column of wood or steel used for support of underground openings.

SUMP - An excavation in the shaft or mine made below the mining level to collect mine water.

SUPPLY PLATFORM - Area set aside for storage of materials.

SURVIVOR - Person found alive in the mine.

SWITCH - An electrical switch.

TAGLINE - Short line no longer than 3 feet hooked from a team member to the team line.

TEAM LINE - Line that links team members together (extension of lifeline).

TIMBER SET - Tunnel support consisting of a roof beam or arch and two posts.

TYING ACROSS AND BEHIND - Systematic exploration of all intersecting and adjacent passageways so that the team is never forward (toward the working face) of an accessible, unexplored area.

UNDERCAST - An enclosed airway built at an intersection of mine passages that permits one air current to pass under another air current without mixing.

UPCAST - The opening through which the return air is removed from the mine. The opposite of downcast or intake.

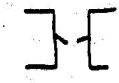
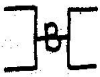
VENT BAG - An enclosed airway to direct airflow to a given area or location.

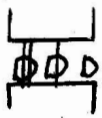
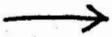
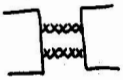
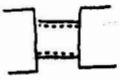
WINZE - An opening, like a small shaft, sunk from an interior point in a mine.

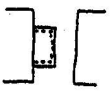
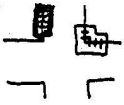
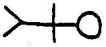
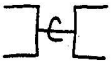
WORKING PLACE - Any place in or about a mine where work is being performed.

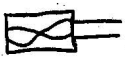
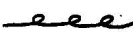
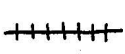
MINE MAP LEGEND

This legend must be used by all teams participating in the National Mine Rescue Contest.

	**Gas Test**	For each gas test conducted.
	**Seal**	If the seal is equipped with devices such as sampling tubes or water traps, or is damaged, leaking, or destroyed that particular device or condition is noted beside the symbol.
	**Permanent Stopping Intact**	Stopping is intact, airtight. (No indication of opening or leakage.)
	**Permanent Stopping Not Intact**	Stopping may be destroyed, partially destroyed, or have openings. Is not airtight. Condition noted on placard is to be shown on map beside symbol.
	**Temporary Stopping Intact**	Stopping is intact and airtight. This symbol is used for all structures built by the team, such as airlocks, etc.
	**Temporary Stopping Not Intact**	Stopping may be destroyed, partially destroyed, or have openings. Is not airtight. Condition noted on placard is to be shown on map beside symbol.
	**Barricade**	Any information on placard, such as leaking, damaged, destroyed, etc. shall be noted on mine map beside symbol.

	**Door**	The "D" symbol can be shown by itself, in permanent or temporary stopping. Type, size, and open or not if indicated on placard, must be indicated on map beside symbol. The curve of the "D" indicates direction of door opening.
	**Regulator**	If the regulator is damaged, leaking, or destroyed, condition must be shown on map. Also, indicate whether open (how much) or closed.
	**Fire**	Write out any information given on placard about fire, on map beside symbol.
	**Air Movement**	Show arrow in direction of movement as indicated on placard, and how any quantity, if given, or other information, such as flow velocity. Put on map beside symbol.
	**Water**	Indicate depth or any other information as shown on placard. Put on map beside symbol.
	**Caved**	Caved areas are not considered airtight unless so stated on placard. Write out any information on placard beside symbol on map.
	**Unsafe Roof Across Entry Rib-to-Rib**	Symbol used for any indication of questionable roof conditions. May or may not be scalable. Write out any other information on placard on map beside symbol.

	**Unsafe Roof Partially Across Entry**	Symbol used for any indication of questionable roof conditions. May or may not be scalable. Write out any other information on placard on map beside symbol.
	**Unsafe Rib or Over-hanging Brow**	Symbol used for any indication of questionable rib conditions. May or may not be scalable. Project over rib line area on map. Write out any other information on placard on map beside symbol.
	**Body**	Indicate position of head and feet as body is found. If word "body" is on placard, show symbol. Indicate any additional information on placard on map beside symbol.
	**Live Person**	Indicate position of head and feet as found. Write out condition, such as conscious, walking, etc. Indicate any injuries as given on placard. Write out information on map beside symbol.
	**Check Curtain**	Condition of check, if noted on placard, must be shown on mine map beside symbol. Ex. "Partially down"
	Line Brattice or Line Curtain	The full extent of curtain shall be shown. If the curtain is partially or completely down, it must be noted on the map beside the symbol.
	**Overcast**	If it is damaged, leaking, or destroyed, that particular condition is to be noted on the map beside the symbol.

	**Under-cast**	If it is damaged, leaking, or destroyed, that particular condition is to be noted on the map beside the symbol.
	**Fan**	Write out the conditions of the fan, and any other information indicated on placard, on the map beside the symbol.
	**Fan with Tubing**	Write out the conditions of the fan, tubing, vent bag or placard on the map by symbol.
	**Brattice Frames**	Indicate any information on placard on mine map beside symbol.
	**Brattice Cloth or Brattice Material**	Indicate any information on placard on mine map beside symbol.
	**Gas Mixture**	Use for any placard indicating a gas or a mix of gases in the mine atmosphere. Write out the gas name or symbol and indicate PPM or percent (%) if shown on placard.
	**Smoke**	Write out light, heavy, dense, or any other information indicated on placard, on map beside the symbol.
	**Elon-gated Object**	For use in indicating pipelines, cables, and other objects usually found that are of any length. Do not use for cable coiled, etc. Write out any other information about object on map beside symbol.
	**Track**	Write out any information noted on placard on map beside symbol.

	**Mobile Equipment**	Use for all mobile face equipment. Write out any other information given on placard on map beside symbol on map.
	**50 Foot or First Team Check Inby Fresh Air Base**	Used for 50 foot check of team members.
	**20 Minute Apparatus Check**	Used for every 20-minute apparatus check of team members.
	**Farthest Point of Advance**	Should be used only where areas inby will not be explored for whatever reason. Not to be used where other conditions block travel.
	**Captain's Date and Initial**	Use for all locations where the team captain dated and wrote his initials.
	**Power Center**	Self explanatory - Write out any information noted on placard.
	**Other Objects, Conditions, or Equipment**	Write the name of the object, condition, or equipment and other information indicated by placard on map beside the symbol. This would include a "face" if marked by a placard.

Visit the Department of Labor
Web site at www.dol.gov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