Surface Mine Supervisor MSHA Compliance Manual

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This manual is an attempt by the Michigan Mine Safety and Health Training Program, under funding provided by the MSHA State Grants Program, to provide surface mines in Michigan, as well as in other states in the US, with a single source of information to introduce them to the requirements set forth in Title 30 of the Code of Federal Regulations (30 CFR), as well as to provide additional information on how to comply with these regulations.

The current manual is a condensed version of our earlier detailed MSHA-Compliance manual. While we have striven for accuracy and clarity, we are fully aware that no such publication can be considered to be a substitute for the standards. Nevertheless, we believe that becoming familiar with the materials presented here is an excellent first step to MSHA compliance.

Where questions arise, 30 CFR must be consulted. If errors are found, or for a copy of the more detailed manual, contact Dave Carlson (dcarlson@mtu.edu or phone 906/487-2453).

Section 1

Supervisor Responsibility & Accountability Under the Federal Mine Safety Act and the MINER Act of 2006

Action Items

Supervisor Responsibility & Accountability

1. Familiarize yourself with CFR 30 Part 56
2. Familiarize yourself with changes made by the MINER Act of 2006
3. Always keep the following in mind:
    a. **Never** willfully violate a regulation. You will be personally accountable and may receive large personal fines and jail time.
    b. **Never** allow a worker to break a safety rule or regulation. This is a willful violation and may result in large personal fines and jail time for the upervisor.
    c. If a question of legality arises, look up the standard or contact your lawyer.
    d. **Never** falsify records required to be kept by MSHA. This will result in large personal fines and jail time.
    e. If a citation appears to be warranted by the facts, correct the cited violation and follow inspector's recommended timetable. If this timetable seems too short, discuss your reasoning with the inspector.
    f. Do not reward unsafe behavior. Rather, punish workers who violate safety rules. You need to carefully plan out and execute a step-by-step disciplinary procedure when employees violate safety rules, and you must inform all your employees of what these procedures are.

4. If you wish to contest a citation, contact your lawyer for the best way to proceed. Procedures and criteria for contesting citations have grown more complex, so competent counsel is normally needed to determine whether a contest is warranted.

TRUE/FALSE – Mark an X in as many as apply

1. Larger mines pay higher MSHA fines than smaller mines for the same serious violation. T___, F___
2. Profitable mines pay higher MSHA fines than unprofitable for the same serious violations. T___, F___
3. Previous violation history does not affect amount of the fine for a serious violation. T___, F___
4. MSHA will not reduce the fine if the serious violation is corrected right away. T___, F___
5. The maximum fine for an S&S violation is $10,000. T___, F___
6. A missing guard where almost no one is likely to get hurt would result in a lower fine. T___, F___
7. An S&S violation is defined as a violation that is reasonably likely to result in serious injury or illness. T___, F___
8. MSHA considers an injury to be serious if it results in lost work days. T___, F___
9. MSHA might possibly withdraw miners from a work area for the following reasons:

   1) Miner complains about discrimination. T___, F___
   2) Inspector finds a guard off moving machinery. T___, F___
   3) Inspector finds the brakes aren't working properly on a loader. T___, F___
   4) An immediately-reportable accident has occurred in the area. T___, F___
   5) The last time the inspector was there, he found the fire extinguishers hadn't been checked and the condition still exists. T___, F___
   6) The mine operator fails to produce the proper training certificates. T___, F___

10. MSHA can issue a withdrawal order for the following reasons:

    1) A cited violation is not corrected in a reasonable period of time? T ___, F ___
    2) Unwarrantable failure S&S violations are cited during two MSHA visits within 90 days. T___, F___
    3) The finding of S&S violations on subsequent MSHA visits that are similar to the ones for which withdrawal orders in item 2 were issued. T___, F___
    4) Finding an S&S violation within 90 days of issuing a written statement to the mine that a pattern of S&S violations exists. T___, F___
    5) Finding an S&S violation on any subsequent visit after a withdrawal order has been issued for reasons given in item 4. T___, F___

Ans. 1-8 -- TTFFFTTT, 9 -- FTTTTT, 10 -- TTTTT

Supervisor Responsibility and Accountability under the Mine Act and the new MINER Act of 2006 – This is a brief summary of the parts of the act that you need to be familiar with. Bold and underlined items indicate changes made by the MINER Act of 2006

Definitions

- **"Agent of the Company"** means anyone responsible for operating all or a part of a mine, or anyone who supervises or directs miners (including hourly people.) Under new case law in 2009, this now includes hourly workers who do workplace examinations under 56.18002.
- **"Knowingly"** means knowing or having a reason to know. A supervisor has a reason to know about what he can legally ask his workers to do. He can be held liable even for *unintentionally* violating regulations that he should have known about as part of his job.
- **"Willfully"** means *intentionally* disobeying standards or recklessly disregarding them. Supervisors can be held liable for willfully violating regulations. **See "Criminal Penalties" below.**
- **"Unwarrantable Failure"** is a term applied to S&S citations where a mine operator or one of his agents "knowingly" or "willfully" participated in the violation being cited. The finding of unwarrantable failure can trigger special investigations, including civil or criminal charges against the operator or his agents.

Penalties Imposed for Violations

The company will be penalized for violations of MSHA regulations under regular assessment rules. (The Miner Act of 2006 eliminated 'Single Penalty Assessments' for non-S&S violations.) **Civil penalties for regular assessments can be up to $60,000.** Regular assessment violations, along with the more serious 'Special Assessments' (such as for 104d citations, or cases of serious injuries or fatalities) are assessed using a formula that considers the appropriateness of the penalty to the size of the business of the operator charged, the operator's history of previous violations, whether the operator was negligent, the gravity of the violation, any demonstrated good faith of the operator charged in attempting to achieve rapid compliance after notification of a violation, and the effect of the penalty on the operator's ability to continue in business. (See 30 CFR 100.3 for formula details.) Information supplied by supervisors helps determine these factors. **Violations that are deemed to be flagrant may be assessed a civil penalty of not more than $220,000. For purposes of the preceding sentence, the term 'flagrant' with respect to a violation means a reckless or repeated failure to make reasonable efforts to eliminate a known violation of a mandatory health or safety standard that substantially and proximately caused, or reasonably could have been expected to cause, death or serious bodily injury.**

- ## S & S (Significant & Substantial) Violations
  These violations are reasonably likely to result in a serious injury or illness and are a part of assigning the more costly 104(d) designation to the citation.

- **Orders of Withdrawal**
  MSHA orders the withdrawal of miners for 1) an imminent danger, 2) not correcting a violation on time, 3) accident investigations, 4) lack of proper safety & health training.

- **Unwarrantable Failure**
  Unwarrantable failure is a negligence determination and is part of assigning the more costly 104(d) designation to a citation. A second unwarrantable failure violation occurring within 90 days of the first one triggers a withdrawal order. Continued similar violations will trigger more withdrawal orders.

- **Pattern of Violations**
  If MSHA determines that a "pattern" of violations **either S&S or non-S&S** exists, the mine is informed of this and given a chance to improve compliance. If, during the same inspection or any subsequent inspection of such mine within 90 days after the issuance of such citation, another violation of any mandatory health or safety standard exists which is caused by an unwarrantable failure of the operator to comply, the inspector can issue a withdrawal order until such violation has been abated.

- **Discrimination Protection**
  The law prohibits discrimination against miners, their representatives, or job applicants for exercising their safety and health rights under the MSHA act.

- **Criminal Penalties**
  Section 110(b)(2) Criminal sanctions (jail time) can be assessed against mine operators and agents who knowingly and willfully violate standards. MSHA turns appropriate cases over to the U.S. Justice Department. **Any operator who willfully violates a mandatory health or safety standard, or knowingly violates or fails or refuses to comply with any order issued under section 104 (citations) and section 107 (orders), or any order incorporated in a final decision issued under this title, except an order incorporated in a decision under paragraph (1) or section 105(c), shall, upon conviction, be punished by a fine of not more than $250,000, or by imprisonment for not more than one year, or by both, except that if the conviction is for a violation committed after the first conviction of such operator under this Act, punishment shall be by a fine of not more than $500,000, or by imprisonment for not more than five years, or both.**

The Mine Act - Sections of Interest to Supervisors

- **Section 103 – Accident Investigations, Reports, and Inspections**

1. MSHA is required to make 4 inspections at underground and 2 at surface mines each year (1 at seasonal surface operations).
2. **Sec. 103(j) Immediately Reportable accidents: Notification to MSHA shall be made by the operator within 15 minutes of the time at which the operator realizes that the death of an individual at the mine, or an injury or entrapment of an individual at the mine which has a reasonable potential to cause death, has occurred. The operator of a coal or other mine who fails to provide timely notification to the Secretary as required under section 103(j) (relating to the 15 minute requirement) shall be assessed a civil penalty by the Secretary of not less than $7,500 and up to a maximum of $70,000.**

3. Mine operators are required to investigate and record (for MSHA) all reportable accidents to determine causes and means of prevention.
4. A representative of the operator and one from the miners can accompany federal inspectors during inspections (including pre- and post-inspection conferences) without loss of pay.
5. Any miner or their representative can contact MSHA and request an immediate inspection. The miner's names are kept confidential.

- **Section 104 - Citations and orders.**

MSHA is required to issue citations for violations and (or) withdrawal orders as described in the following sections of the Federal Mine Act:

1. 104(a) The general citation rule.
2. 104(b) A citation not abated in the time allotted.
3. 104(d)(1) Unwarrantable failure S&S violations are cited during two MSHA visits within 90 days. **The minimum penalty for any citation or order issued under section 104(d)(1) shall be $2,000.**
4. 104(d)(2) S&S violations are found on subsequent MSHA visits that are similar to the ones cited in item 3. **The minimum penalty for any order issued under section 104(d)(2) shall be $4,000.**
5. 104(e)(1) S&S violation found within 90 days of a written statement that a pattern of S&S violations exists.
6. 104(e)(2) S&S violation found on any subsequent visit after withdrawal order is issued for reasons in item 5.
7. 104(g) Miners have not received required S&H training (miners are withdrawn and paid until the violation is abated).

- **Section 105 - Procedures for Enforcement (procedures MSHA must follow)**

- **Section 106 - Judicial Review.**

Any person adversely affected by a decision of the Federal Mine Safety and Health Review Commission, may obtain a review of the decision by the US Court of Appeals for your region.

- **Section 107 - Procedures to Counteract Dangerous Conditions.**

107(a) If an MSHA inspector discovers an imminent danger, he/she can issue a withdrawal order until the dangerous condition is corrected.

- **Section 108 - Injunctions.**

This allows MSHA to initiate civil actions, such as temporary or permanent injunctions, against a mine operator, or an agent of the company, if they violate a provision of the Act.

- **Section 109 - Posting of Orders and Decisions.**

A copy of orders, citations, notices, or decisions required to be given to a mine shall be delivered to a representative of miners at the affected mine. A copy shall be posted on the mine bulletin board.

- **Section 110 – Penalties**

1. 110(a) Civil penalties up to **$60,000** for each violation of a mandatory health or safety standard and for each occurrence of a particular violation.
2. 110(b) Up to **$6500** a day may be assessed for each day the failure or violation continues.

3. 110(c) subjects directors, officers and agents to similar penalties (see above) for violating standards or failure or refusal to comply with any order.
4. 110(d) Operators willfully violating regulations or who refuse to comply with orders issued under sections 104 or 107 can be fined up to $250k and/or jailed for 1 year. Violations reviewed for 110(d) action include:
    a. 107(a) (imminent danger) order with 104(a) citation & high negligence.
    b. 104(d) (unwarrantable failure) with S&S and high negligence.
    c. Operator working against an order (such as failure to comply with a withdrawal order).
    d. District Manager prerogative.
5. 110(e) Persons giving advance notice of inspections can be fined $1000 or jailed 6 months.
6. 110(f) Persons making false statements, representations, or certifications in any application, record, report, plan or other document required to be filed/maintained by MSHA is subject to fines up to $250k, 5 yrs. jail, or both.
7. 110(g) Miners in underground coal and underground gassy metal/nonmetal mines, who smoke or carry smoking materials, matches, or lighters into these mines, are subject to fines up to $275 for each violation. In surface mines or surface areas of underground mines where smoking could cause a fire or explosion, the restriction on 'smoking materials' doesn't apply, but the restriction and fines for actually smoking does.
8. 110(h) subjects anyone who knowingly distributes, sells, offers for sale, introduces, or delivers in commerce any mining equipment, accessories, etc., to fines up to $250k and imprisonment up to 5 years for falsely representing the equipment as complying with the requirements of the Act.
9. 110(i) mandates that the inspector issue a citation for a violation of a mandatory safety and health standard (no inspector discretion is allowed.)

- **Section 115 – Training**

Outlines the various types of mine safety and health training required (covered in a separate section of this manual).

Conferencing Citations - 30 CFR § 100.6

Disclaimer: Please note that the following is the authors' interpretation of laws and practices surrounding the conferencing of mine citations, and is not to be considered a statement of law. Please consult with your own legal counsel to determine what conferencing actions are best suited for you.

Mine inspectors may not see all of the circumstances surrounding a cited violation. MSHA gives mine operators and their employees several opportunities to bring up circumstances that could favorably affect the citation or its penalty. Remember, however, that it is also possible for mine operators and their employees to voluntarily bring up circumstances that will **unfavorably** affect citations and their penalties. Please keep the following important mine operator rights and duties in mind. (Bulleted information below is paraphrased from Aggregates Manager magazine 2007.)

- Mine operators and their 'agents' (i.e.supervisors) have the right and duty to manage, including training employees to comply with safety rules, and enforcing those rules with even-handed discipline. Ignoring infractions (or management engaging in them) will be used by MSHA to prove a high level of negligence or guilt when writing citations. However, if management can show that they enforce their rules, these actions become a "mitigating factor" that reduces negligence and penalties associated with violations.

- Never lie, never falsify a document, and never mislead or conspire to mislead MSHA inspectors. Falsification of a written MSHA record is a felony that carries a potential five-year prison term and a large fine, a risk not worth taking to "cover up" what at most may be a willful MSHA criminal regulatory violation - a misdemeanor, with a maximum one-year sentence that most likely can be settled as a civil fine.
- Never admit prior knowledge of a violation or hazard. While lying is not an option, silence is your right (freedom of speech and freedom not to speak). MSHA inspectors strive to obtain "admissions of previous knowledge of violative conditions" from management agents (e.g. foremen, supervisors, and plant managers) because admissions make proving that the violation was willful easy.

In the final analysis, it is best to consult with your legal counsel to determine what is considered 'appropriate mitigating circumstances' to bring up during conferences.

1. Conferencing a citation with the inspector during the inspection. Point out any information missed, or answer the inspector's questions following your companies approved guidelines.

   Please note that anything said to, or in front of, an MSHA inspector is considered to be "On the Record" for legal purposes. MSHA inspectors are NOT required to give anyone a "Miranda Warning" stating that they have the right to remain silent and that anything they say can be used against them in a court of law. However, this **does not** mean that you do not have these rights, or do not have a right to legal counsel being present. You still have these rights - it's just that MSHA inspectors are not required to tell you about them.

   The above being the case, anyone accompanying a mine inspector must be a good communicator and fully aware of what he/she is telling the inspector. Legal counsel usually advises everyone to NOT give voluntary information. Restrict yourself to information than is **legally** requested. (If there is any question about the legality of an inspector's request for records, request that the inspector show you the standard which requires that such a record be made available to MSHA.) Supervisors can advise subordinates of this, but must never tell them to intentionally withhold information that is **legally** requested. This can be considered obstruction of justice. If you, as the company representative, disagree with an inspector's assessment of a potential hazard, disagree **respectfully**. A confrontation between the representative of the mine and the inspector can be very costly for the mine, because the inspector has authority given by the US Congress to demand compliance and severely punish noncompliance with rules established by MSHA.

2. Closeout Conference. Bring up any other pertinent information concerning the citations. Appropriate mitigating information for a closeout conference follows the same guidelines as for information given at the time of the inspection. It's just that you may need some additional time to put together certain information (such as tracking down pertinent records, etc.). Thus you are given another opportunity to give the inspector additional mitigating information regarding citations.

3. MSHA Supervisory Conference. All parties will have 10 days within which to submit additional information or request a safety and health conference with the District Manager or designee. The formal Supervisory Conference will not be held until after the penalty is proposed and timely contested. Requests for safety and health conferences under 30 C.F.R. § 100.6 must be in writing and must include a brief statement of the reason why each citation

or order should be conferenced. Failure to provide the brief written statement is a basis for denying a conference request. A request for a safety and health conference will be granted at the discretion of the District Manager or his or her designee. If granted, the conference will be scheduled in most cases after the civil penalties have been proposed and MSHA has received a timely notice of contest. Refer to MSHA PROGRAM INFORMATION BULLETIN NO. P09-05, March 27, 2009.

4. Up to 30 days after the citation is issued. Operators or miners' representatives can file an Immediate Contest. (See below).

Contesting Citations & Withdrawal Orders - 29 CFR § 2700.20

The following is an attempt by the authors to summarize the procedural rules of the Federal Mine Safety & Health review commission (fmshrc) concerning contests. To view the actual rules go to the fmshrc website at: http://www.msha.gov/SOLICITOR/FMSHRC/fmshrc.htm and view: http://www.fmshrc.gov/rules/29cfr2700_01.html#2700.20.

Immediate Contests

If an enforcement action seems wrong or seems to force unreasonable compliance costs on you, you may contest the following:

- A citation, withdrawal order, or imminent danger order.
- A subsequent modification of the citation or the order.
- The reasonableness of the abatement time specified in the citation. Many companies consult with competent legal counsel when deciding what citations to immediately contest.

When to file Immediate Contest – You must file the contest within 30 days of the receipt of the citation, order, or modification of citation or order.
Where to file – Mail your notification of intent to contest directly to the Mine Safety and Health Review Commission, 607 New Jersey Avenue, N.W., Washington, D.C. 20001, (202)434-9900, web site is: www.frmshrc.gov (see 29 CFR 2700.18(b)), and mail a copy to the Office of the Solicitor, Division of Mine Safety and Health (MSH), Ballston Tower #3, 4th floor, 4015 Wilson Boulevard, Arlington, Virginia, 22203. In addition, a copy should be given to all known representatives of miners at the affected mine.
What to file – MSHA does not have a specific form to fill out for immediate contest. Make your own form and label it as "Contest." Date the document. Include your Company Name and other mine identifying information. Specify the action contested. Include a short statement that contains the following: 1) Issues of fact you disagree with. 2) Issues of law you disagree with. 3) The relief you are seeking. Attach legible copy of the citation or order contested.
How to file – File by "personal delivery." This includes courier service and registered or certified mail – return receipt requested.
MSHA Secretary's Answer – MSHA must file an answer to your contest within 20 days.
Subsequent Citations or Orders – You must file with the Commission within 30 days **any s**ubsequent MSHA citations or orders that modify or terminate the original. Otherwise your contest will be interpreted as contesting all subsequent citations or orders. This is important

because you would obviously not *want* to contest a citation or order which terminates the original citation or order.

Effect of Failure to file Immediate Contest – Not immediately contesting a citation or order does not prevent you from challenging the subsequent civil penalty proceeding (see below). In this proceeding, you may challenge the fact of violation and any "special findings" such as S&S and Unwarrantable Failure.

Contesting Proposed Penalties

After a citation or withdrawal order is issued, MSHA must send you notification of the violation, the penalty proposed, and a notice of your right to file (within 30 days) a contest and request a hearing before a Commission administrative law judge.

Every civil penalty assessment lists each citation and/or order for which a penalty is being assessed.

An operator has the option to contest all or some of the penalties by placing a check mark beside each citation and/or order listed on the assessment to be contested.

The operator is also requested to state the reasons for the contest.

A copy of the contested assessment must then be returned to MSHA's Civil Penalty Compliance Office, 1100 Wilson Boulevard, Arlington, VA 22203-1984 within 30 days of the operator's receipt.

The Civil Penalty Compliance Office (CPCO) (www.msha.gov/PROGRAMS/ASSESS.HTM) is responsible for tracking all civil penalty cases, from the time they are generated through final payment or closure; for preparing contested cases for litigation; for processing and accounting for all payments; and for collecting and accounting for delinquent penalties.

If you fail to timely contest a civil penalty, the proposed penalty is treated as a final order not subject to review.

An operator who wants to contest a civil penalty assessment must provide such notification regardless of whether or not the operator has previously contested the underlying citation(s) and/or order(s).

Consult the Federal Mine Safety & Health Review Commission's procedural rules for more detailed information. Information on the Commission can be found on the Internet at www.fmshrc.gov .

General Guidelines for Emergency Response and MSHA Inspections

General Media Response

If contacted by the media, and you are not the company spokesperson, say ONLY the following: "We are working to control the situation. Our company spokesperson is on the way. We expect that _____(name) will be at _____ (location away from the incident scene) about _____ (time) to provide you with information on the incident. Our Incident Commander will let you know if there are any changes to this schedule."

"Who does what?" During and Accident/Emergency (this is just an example of one scenario).These duties should be spelled out in your emergency response plan.

OPERATION MANAGER: Ensures that site is safe and scene is secured. Sets up Crisis Command Center. Takes pictures.
SUPERVISOR: Assesses Site. Implements Crisis Plan. Assigns tasks to employees and continues to assess site/situation.
LOADER OPERATORS: Control Entrance and Exit points. Loaders can be used to block unauthorized entrance. (Curious bystanders, etc.)
FIRST RESPONDERS: Emergency Care and Scene Safety.
SCALEHOUSE PERSONNEL OR ENTRANCE SECURITY: Call 911, along with the Safety Manager, Business Unit Manager, and Human Resources Coordinator.
PLANT OPERATORS: Enact Emergency Shut Down of Plant and On-site roads, Secure Equipment, Provide Traffic Control.
LABORERS: Assist Supervisors at the scene.
MAINTENANCE PERSONNEL: Provide and/or remove equipment as directed by the Supervisor.

A Checklist For Handling An MSHA Inspection: Opening Conference:

- Ask what the purpose for the inspection or visit is?
- Establish a congenial and cooperative relationship with the inspector.
- Establish who will accompany the inspector such as site safety rep, employee, or miner's rep, etc. It is very important that the person representing the operator be pre-selected for this duty based on knowledge of the operation, congeniality, self-control and wisdom. Accompanying the inspector should be rated as one of the most important duties undertaken on the mine-site.
- Establish the intended route for the visit or inspection.
- Ask the inspector to inform you of any potential violation(s) at the time they are observed.

A Checklist For Handling An MSHA Inspection: Records:

- Ask the inspector to provide a written list of requested records.
- Provide the list to the Safety Manager for review.

- Have MSHA-required records available including, among others: Quarterly reports 7000-2, Accident, Injury & Illness 7000-1, Certificates of Training 5000-23, first aid training records, work area noise level records, work area inspection records for each shift, MSDSs for hazardous chemicals and other records required by MSHA such as a Training Plan and a lesson plan that is updated annually.
- Inform the inspector that any request for records not required by the MSHA Act will be reviewed by the Safety Manager (or other designated person).

A Checklist For Handling An MSHA Inspection: Participating in the Inspection

- Accompany the inspector at all times.
- Take photographs/samples of the same items the inspector does.
- Take notes of all conditions noted by the inspector.
- Discuss immediately with the inspector the reasons for and/or hazards caused by any alleged violation the inspector notes.
- Arrange abatement and/or protective measures as soon as possible and while the inspector is present if possible.
- Discuss abatement time extensions, if needed.
- Do not make admissions against your company's interests.
- Give inspector only the facts, not guesses.
- Take notes of all available evidence regarding any alleged violation.
- Preserve physical evidence, if possible.

A Checklist For Handling An MSHA Inspection: Closing Conference:

- Request a closing conference with inspector.
- Request duplicates of MSHA samples, photographs, etc.
- Ask questions regarding alleged violations and suggested abatement methods.
- Ask what citations will be issued.
- Correct any factual misunderstandings.
- Do not make admissions against your company's interests.
- Take notes, make no promises.

THE CITATION -- The Main Elements:

1. Did the alleged conduct constitute a violation of the standard cited?
2. If so, how serious an accident would likely result?
3. Did the violation stem from the operator's aggravated ("unwarrantable") conduct?

Section 2
Safety & Health Regulations

Action Items

1. Learn how to access regulations and Program Policy Manuals on MSHA's Internet Site. Regulations on MSHA's Internet Site contain hyperlinks which, when clicked, automatically transfer you to appropriate information in MSHA's Program Policy Manual.
2. If you do not have the Internet, Purchase a copy of the regulations (use ordering information in this section). The little blue book (green copy), and variations thereof have excellent indexes and contain 30CFR, Part 56, the part most used by surface mine supervisors.
3. If you use a hard copy of the regulations, you may also want to order a hard copy of MSHA's Program Policy Manual following the instructions contained here.
4. Familiarize yourself with and make sure you are in compliance with the commonly-cited regulations listed in this section.

Where to get the most up-to-date MSHA Information

MSHA Internet Site (www.msha.gov)

The MSHA Internet site is the best, most complete, and most up-to-date source of official MSHA information. Among other things, Safety training instructor guides and training plan kits can be downloaded from this site. There are several ways to navigate the site.

Top Violations Cited by MSHA

Want to know what the most common Violations Cited by MSHA? – Go to the MSHA Internet site – MSHA.gov. Currently the specific address for this information is http://www.msha.gov/STATS/Top20Viols/top20home.asp

How to Purchase 30 CFR, MSHA Program Policy Manual and the Little Blue/Green Book

30 CFR Parts 1-199 is posted at MSHA's Internet site: www.msha.gov. This is the most handy form in that you can look up the regulation, print it out, and link directly with MSHA's program policy pertaining to that regulation.

To order 30 CFR: It may be ordered from **Mine Safety Associates,** PO Box 872, Price, UT 84501 -- Phone: (800) 430-2377, Fax: (435) 637-8614, E-mail: mailto:sales@minesafetyassoc.com. The price as of July 2004 is $57. See information at www.minesafetyassoc.com.

Or order from the GPO Superintendent of Documents on the Internet at:
http://www.gpo.gov/customers/p-i-sales.htm
Click on "Catalog of Publications" and then type "30 CFR" into the search catalog box.

Or write to the Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954
Phone: (202) 512-1800 (7:30am - 4:30pm Eastern) FAX: (202) 512-2250

Questions or Comments: Call the GPO Order Desk at 1-202-512-1800 or fax 1-202-512-2250 between 7:30 a.m. and 4:30 p.m. eastern time, Monday through Friday, for information about other print publications or CD-ROM sales.

To order the Little Blue Book or a Variation Thereof: Mine Safety Associates, Price Utah 84501 (800-430-2377) sells these 2"x 4" pocket-sized booklets. Several Versions are available containing different parts of 30 CFR. Call to ensure that you receive the edition you need. See information at www.minesafetyassoc.com. The green copy contains most of what pertains to metal-nonmetal mines.

Some Regulations of Special Interest to Supervisors of Surface Metal/Nonmetal Mines

If an MSHA inspector comes to your property for an inspection, the following is a list of regulations that will likely be included in the inspection. Remember all mine operators are required to be in compliance with all MSHA regulations that apply to their mine operation. However, the following is a good checklist to start with.

NOTE: The narrative following the regulation number in this list is an abridged version of the full regulation. It is intended to give you a general idea of what that regulation states. ***For the full regulation and MSHA policy, see 30 CFR and MSHA's Program Policy Manual***.

ACCESS

56.11001 - Access - safe
Safe means of access shall be provided and maintained to all working places.

56.11027 - Scaffolds and working platforms
Scaffolds and working platforms shall be safe to work on and maintained in a safe condition. Good information on scaffolding construction may be obtained from OSHA regulations in CFR 29 subpart L 1926.451

56.11012 - Openings around travelways
Openings above, below, or near travelways through which persons or materials may fall -- must be protected by railings, barriers, or covers. Where it is impractical to install such protective devices, adequate warning signals must be installed.

56.11016 - Snow and ice cleanup
Regularly used walkways and travelways shall be sanded, salted, or cleared of snow and ice as soon as practicable.

56.11002 - Toeboards and handrails
Crossovers, elevated walkways, elevated ramps, and stairways shall be of substantial construction provided with handrails, and maintained in good condition. Where necessary, toeboards shall be provided. Toeboards prevent tools and materials from falling off a walkway and creating a hazard to workers below. They also help prevent workers from slipping under the guardrail.

COMPRESSED GASES

56.16005 - Compressed and liquid gas cylinders
Compressed and liquid gas cylinders shall be secured in a safe manner.

56.16006 - Compressed gas cylinders - Valves
Compressed and liquid gas cylinder valves shall be protected by covers when being transported or stored, and by a safe location when the cylinders are in use.

56.4601 – Storage of Oxygen Cylinders -- Oxygen.
Cylinders shall not be stored in rooms or areas used or designated for storage of flammable or combustible liquids, including grease.

ELECTRICAL

56.12032 - Cover plates
Inspection and cover plates on electrical equipment and junction boxes must be kept on except during testing or repairs.

56.12030 - Dangerous condition, correction of
When a potentially dangerous condition is found it must be corrected before equipment or wiring is energized.

56.12004 - Electrical conductor size
Electrical conductors must be of sufficient size and load carrying capacity and also protected from mechanical damage.

56.12001 - Fuses and circuit breakers
Circuits must be protected by fuses or circuit breakers of the correct type and capacity.

56.12034 - Guarding lights
Portable extension lights and other lights that by their location present a shock or burn hazard must be guarded.

56.12025 - Grounding
All metal enclosing or encasing electrical circuits must be grounded or provided with equivalent protection. This requirement does not apply to battery-operated equipment.

56.12028 – Testing of grounding systems
Continuity and resistance of grounding systems shall be tested immediately after installation, repair, and modification, and annually thereafter. A record of the resistance measured during the most recent tests shall be made available on a request by the Secretary or his duly authorized representative.

56.12008 - Insulation on wires and fittings
Wires and cables must be insulated where they enter electrical compartments. Cables must enter metal frames through proper fittings. The holes must be bushed with insulated bushings

56.12018 - Labeling power switches
Principal power switches must be labeled to show which units they control, unless obvious by location.

56.12035 - Lamp sockets construction
Lamp sockets must be of a weatherproof type where they are exposed to weather or wet conditions that may interfere with illumination or create a shock hazard.

56.12016 and .12017 -Lockout/Tagout
Electrically powered equipment must be de-energized before performing mechanical work. Power switches must be locked out or other measures taken. Suitable warning notices must be posted at the power switch and signed by the individuals doing the work. Locks are to be removed only by persons who installed them or authorized personnel. Power circuits shall be de-energized before work is done on such circuits unless hot-line tools are used. The individuals who are to do the work shall post suitable warning signs. Switches shall be locked out or other measures taken which shall prevent the power circuits from being energized without the

knowledge of the individuals working on them. Such locks, signs, or preventative devices shall be removed only by the person who installed them or by authorized personnel.

56.12013 - Splices, Permanent
Permanent splices and repairs made in power cables, including the ground conductor where provided, shall have the equivalent of or better conductivity, strength and insulation characteristics than the original conductor

56.12021 - Signs, Danger
Suitable danger signs must be posted at all major electrical installations.

56.12067 - Transformer enclosures
Transformers must be totally enclosed, or placed at least 8 feet above the ground, or installed in a transformer house, or surrounded by a substantial fence at least 6 feet high and at least 3 feet from any energized parts, casings, or wiring.

56.12068 - Transformer enclosures
Transformer enclosures must be kept locked against unauthorized entry.

DUST/NOISE – See Health

EMERGENCIES

56.15001 - Emergency supplies
Adequate first-aid materials, including stretchers and blankets, shall be provided at places convenient to all working areas. Water or neutralizing agents shall be available where corrosive chemicals or other harmful substances are stored, handled, or used.

56.18012 - Emergency telephone numbers
Requires posting at appropriate telephones. Note: It does little good to have emergency phone numbers if the employees are not trained to describe how emergency personnel can locate the site of the emergency.

56.18013 - Emergency communication system
Emergency communication system required at the mine to obtain assistance in the event of an emergency.

56.18014 - Emergency medical assistance and transportation
Requires arrangements be made in advance for obtaining emergency medical help and transportation for injured persons.

56.18010 - First Aid Training
Requires individual currently trained in specified topics and capable of providing first aid to be available on all shifts. First aid training must be made available to all interested miners.

56.18009 Person in charge of mine
Competent person designated by the mine operator shall be in attendance to take charge in case of an emergency.

56.18020 - Working alone.
No employee shall be assigned, or allowed, or be required to perform work alone in any area where hazardous conditions exist that would endanger the employee's safety unless the employee can communicate with others, can be heard, or can be seen.

FALL PROTECTION – SEE PPE

EQUIPMENT -- MOBILE

56.14132 (a) (b) - Backup alarm requirements

a) Manually operated horns or other audible warning devices provided on self-propelled mobile equipment as a safety feature shall be maintained in functional condition.

b) (1) When the operator has an obstructed view to the rear, self-propelled mobile equipment shall have-- (i) An automatic reverse-activated signal alarm; (ii) A wheel-mounted bell alarm which sounds at least once for each three feet of reverse movement; (iii) A discriminating backup alarm that covers the area of obstructed view; or (iv) An observer to signal when it is safe to back up. (2) Alarms shall be audible above the surrounding noise level. (3) An automatic reverse-activated strobe light may be used at night in lieu of an audible reverse alarm.

56.9301 - Berms - dumping locations

Berms, bumper blocks, safety hooks, or similar impeding devices must be provided at dumping locations where there is a hazard of overtravel or overturning.

56.9300 - Berms/guardrails - roadways

Berms or guardrails of at least mid-axle height (of largest vehicle) must be provided and maintained on banks of roadways with drop-off of sufficient grade or depth to cause vehicle to overturn or endanger persons in equipment. Berms may have openings for roadway drainage. Berms are not required on infrequently traveled roads used only by service or maintenance vehicles, when all of the following exist: (1) Locked gates are installed at the entrance points to the roadway, (2) Signs are posted warning that the roadway is not bermed, (3) Delineators are installed along the perimeter of the elevated roadway so that, for both directions of travel, the reflective surfaces of at least three delineators along each elevated shoulder are always visible to the driver and spaced at intervals sufficient to indicate the edges and attitude of the roadway, (4) A maximum speed limit is posted and observed for the elevated unbermed portions of the roadway (factors to consider when establishing the maximum speed limit must include the width, slope and alignment of the road, the type of equipment using the road, the road material, and any hazardous conditions which may exist), (5) Road surface traction is not impaired by weather conditions, such as sleet and snow, unless corrective measures are taken to improve traction.

56.14101 (a) (3) - Brakes

Minimum requirements for self-propelled mobile equipment - Service brake system must be capable of stopping and holding the equipment with its typical load on the maximum grade it travels. Not applicable to equipment not originally equipped with brakes unless the manner in which the equipment is being operated requires the use of brakes for safe operation. (Not applicable to rail equipment.) (2) If equipped, parking brakes must be capable of holding the equipment with its typical load on the maximum grade it travels. (3) All braking systems must be maintained in functional condition.

56.9201 - Loading, transporting, and unloading

Loading, transporting, and unloading of equipment and supplies must not create a hazard to persons from falling or shifting equipment or supplies.

56.14207 - Parking requirements for mobile equipment

Mobile equipment shall not be left unattended unless the controls are placed in the park position and the parking brake, if provided, is set. When parked on a grade, the wheels or tracks of mobile equipment shall be either chocked or turned into a bank or rib.

56.9313 - Road cleanup
Water, debris, or spilled material on roadways, which creates hazards to the operation of mobile equipment, must be removed.

56.14130 (a) - Seat Belts and ROPs requirement and construction
Tells where and how rollover protective structures (ROPS) and seat belts must be installed, how constructed, how maintained, limitations in altering, exceptions (manufactured before 1969) etc. Wearing seat belts. The equipment operator shall wear seat belts except that when operating graders from a standing position, the grader operator shall wear safety lines and a harness in place of a seat belt. Seat belts and tethers shall meet the requirements of SAE J386, "Operator Restraint Systems for Off-Road Work Machines", 1985; or SAE J1194, "Roll-Over Protective structures (ROPS) construction - as under "Wheeled Agricultural Tractors", 1983, as applicable, which are incorporated by reference.

56.14130(i) - Seat belts maintenance
Seat belts shall be maintained in a functional condition, and replaced when necessary to assure proper performance.

56.9100 - Traffic control rules
Requires traffic control rules governing speed, right-of-way, direction of movement, and the use of headlights to assure appropriate visibility; also properly placed signs or signals that warn of hazardous conditions.

56.14103 (a) - Window construction on mobile equipment
Mobile equipment windows must be made of safety glass or material with equivalent safety characteristics. The windows must be maintained to provide visibility for safe operation.

EQUIPMENT -- STATIONARY

Detailed examples of proper guarding are illustrated in MSHA's Guarding Manual, which can be purchased by contacting National Mine Health and Safety Academy, 1301 Airport Road, Beaver, WV 25813-9426 or Phone: 304/256-3257. The entire booklet is also available at http://www.msha.gov/ .

56.14201(b) - Conveyor startup warning
When the entire length of the conveyor is not visible from the starting switch, a visible or audible startup warning is required. The conveyor must start within 30 seconds.

56.14112 (a) (b) - Guard construction
Guards must be constructed and maintained to-- (1) Withstand the vibration, shock, and wear to which they will be subjected during normal operation; and (2) not create a hazard by their use. Guards must be securely in place while machinery is being operated, except when testing or making adjustments, which cannot be performed without removal of the guard.

56.14109 - Guarding conveyors next to travelways
Unguarded conveyors next to travelways must be equipped with-- (a) Emergency stop devices which are located so that a person falling on or against the conveyor can readily deactivate the conveyor drive motor; or (b) Railings which (1) Are positioned to prevent persons from falling on or against the conveyor; (2) Will be able to withstand the vibration, shock, and wear to which they will be subjected during normal operation; and (3) Are constructed and maintained so that they will not create a hazard.

56.14110 - Guarding - flying or falling materials

In areas where flying or falling materials generated from the operation of screens, crushers, or conveyors present a hazard, guards, shields, or other devices that provide protection against such flying or falling materials shall be provided to protect persons.

56.14107 (a) - Guarding of moving machine parts
Moving machine parts must be guarded to protect persons from contacting gears, sprockets, chains, drive, head, tail, and take-up pulleys, flywheels, couplings, shafts, fan blades, and similar moving parts that can cause injury. Guards aren't required where the exposed moving parts are at least seven feet away from walking or working surfaces.

56.14108 - Guarding of overhead drive belts
Overhead drive belts must be guarded to contain the whipping action of a broken belt if that action could be hazardous to persons.

56.14112 - Guards - securing
Guards must be securely in place when machinery is operated.

56.13021 - High pressure hose safety chains
Safety chains or other suitable locking devices shall be used on high-pressure hose lines of ¾ inch inside diameter or larger.

56.14200 - Startup alarm requirements
Before starting crushers or moving self-propelled mobile equipment, equipment operators shall sound a warning that is audible above the surrounding noise level or use other effective means to warn all persons who could be exposed to a hazard from the equipment. The alarm is not required for conveyors where the operator has a clear view of personnel along the entire belt.

EXAMINATIONS (See RECORDS AND EXAMINATIONS here, also see "RECORD-KEEPING -- SECTION 3")

EXPLOSIVES (See 56-6000 through 56.6502 if you use explosives)

Explosives permits that might be required: Check local, State, DOT and ATF for requirements

FIRE PREVENTION

56.4200 (b) (1) - Fire fighting equipment
A mine must have on-site equipment for fighting fires that could endanger persons including: (1) Equipment for fires in their early stages; (2) Equipment for fires beyond their early stages, or prior arrangements with a local fire department to fight such fires. This onsite equipment must be of the type, size, and quantity that can extinguish fires of any class which could occur as a result of the hazards present and is strategically located, readily accessible, plainly marked, and maintained in fire-ready condition.

56.4201 (a) (1,2,3) - Fire extinguisher inspection - records required - (monthly check for full charge and operability) and annual maintenance checks), also must meet hydrostatic testing schedule in standard.

56.4201(a)(4) - Other fire fighting system quarterly inspection and annual use tests.

56.4201(a)(5) - Fire suppression system annual inspection based on the manufacturer's specifications to determine that system remains functional. Surface fire suppression systems are

exempt from these inspection requirements if the systems are used solely for the protection of property and a fire would affect no persons.

56.4501 - Fuel lines
Fuel Lines must be valved for shutoff in case of fire - (doesn't pertain to self-propelled equipment).

56.4402 - Fuel safety cans
Small amounts of flammable liquids must be kept in properly labeled safety cans.

56.6101 - Storage of explosives
Explosives must be stored at least 25 feet from combustibles including dry grass except live trees 10 feet or higher. Other combustibles must not be stored or allowed to accumulate within 50 feet. Drainage of stored combustible liquids must be away from explosive material storage facilities.

56.4601 - Storage of oxygen cylinders
Oxygen cannot be stored in rooms or areas used or designated for storage of flammable or combustible liquids including grease. Oxygen must be separated from any fuel gas by a distance of at least 20 feet or by a 5 foot high wall with a fire resistance rating of ½ hour.

56.4104 - Storage of waste materials
Waste materials, including liquids, must not accumulate in quantities that could create a fire hazard. Waste or rags containing flammable or combustible liquids that could create a fire hazard must be placed in covered metal containers or equivalent.

GROUND CONTROL

56.3130 Wall, bank, and slope stability.
Mining methods shall be used that will maintain wall, bank, and slope stability in places where persons work or travel in performing their assigned tasks. When benching is necessary, the width and height shall be based on the type of equipment used for cleaning of benches or for scaling of walls, banks, and slopes.

56.3131 - Loose or unconsolidated material slopes
In places where persons work or travel, loose or unconsolidated material must be sloped to the angle of repose or stripped back for at least 10 feet from the top of the pit or quarry wall. Other conditions at or near the perimeter of the pit or quarry wall, which create a fall-of-material hazard to persons, must be corrected.

56.3200 Correction of hazardous conditions. Scaling and Support
Ground conditions that create a hazard to persons shall be taken down or supported before other work or travel is permitted in the affected area. Until corrective work is completed, the area shall be posted with a warning against entry and, when left unattended, a barrier shall be installed to impede unauthorized entry.

56.3401 Examination of ground conditions.
Persons experienced in examining and testing for loose ground shall be designated by the mine operator. Appropriate supervisors or other designated persons shall examine and, where applicable, test ground conditions in areas where work is to be performed prior to work commencing, after blasting, and as ground conditions warrant during the work shift. Highwalls

and banks adjoining travelways shall be examined weekly or more often if changing ground conditions warrant.

56.3430 Activity between machinery or equipment and the highwall or bank.
Persons shall not work or travel between machinery or equipment and the highwall or bank where the machinery or equipment may hinder escape from falls or slides of the highwall or bank. Travel is permitted when necessary for persons to dismount.

56.9304 Unstable ground.

Dumping locations shall be visually inspected prior to work commencing and as ground conditions warrant. Where there is evidence that the ground at a dumping location may fail to support the mobile equipment, loads shall be dumped a safe distance back from the edge of the unstable area of the bank.

HAZCOM

Part 47 – See More Details in Section 9 of this Handout – The HazCom (Hazard Communication or Right to Know) standard is a training and information standard. Its purpose is to ensure that workers are aware of the hazards and protective measures for the chemicals they work with or know where they can obtain such information immediately. HazCom does not restrict the use of chemicals in the workplace or set exposure limits.

The HazCom standard was implemented June 21, 2002. It became effective September 23, 2002 for mines with 6 or more employees and March 21, 2003 for mines with 5 or less employees. The mine operator must, at the minimum, have a written Hazcom program and a list of the hazardous chemicals miners are exposed to. An alphabetized notebook of MSDSs for each hazardous chemical is usually considered to be an adequate list. MSDSs can be obtained from the suppliers of the chemicals. The MSDSs must be available to the miners at all times (such as having them in a 3-ring binder in work area).

Miner's must be trained on the contents of the company's written Hazcom program and on the hazards and protective measures for the chemicals a miner works with (it's very important that they know how to use an MSDS to get critical information). This training must take place before each new miner or new experienced miner goes to work or before any miner or contractor performs a new task in which he/she uses hazardous chemicals. The training need only take place once, usually in new miner, new experienced miner or task training, where training certificates indicate that the training has been completed, unless changes (new chemicals, exposures etc.) require retraining. ***Note – If you have not already done so, your Part 46 Plan must be revised to add HazCom to each of these types of training. Contact dcarlson@mtu.edu for assistance.***

See Section 9 of this manual and also Part 47 of the standard for other requirements on labeling, etc., which are, in general, designed to ensure that all containers of hazardous chemicals are clearly marked so the miner has no question about what he/she is working with and the associated hazards. Mines must also have an MSDS for hazardous products containing, among other things, crystalline silica. These must be provided to miners and customers upon request.

56.16004 - Storage of hazardous materials

Hazardous materials shall be stored in containers of a type approved for such use by recognized agencies; such containers shall be labeled appropriately.

56.20012 - Toxic materials used in conjunction with or discarded from mining or milling of a product shall be plainly marked or labeled so as to positively identify the nature of the hazard and the protective action required

HEALTH

56.5001 – Employee Exposure to Airborne Contaminants

(a) Except as provided in paragraph (b) of this section, the exposure to airborne contaminants shall not exceed, on the basis of a time weighted average, the threshold limit values adopted by the American Conference of Governmental Industrial Hygienists, as set forth and explained in the 1973 edition of the Conference's publication, entitled "TLV's Threshold Limit Values for Chemical Substances in Workroom Air Adopted by ACGIH for 1973," pages 1 through 54 etc. (this publication may be obtained from the American Conference of Governmental industrial Hygienists by writing to the Secretary-Treasurer, P.O Box 1937, Cincinnati, Ohio 45201, or may be examined in any Metal and Nonmetal Mine Safety and Health District Office of the Mine Safety and Health Administration). It is important for mine employees to be aware that once an overexposure condition is found by MSHA, the mine operator and its employees are subject to numerous requirements. These include the need to supply and use respirators, possible medical evaluations of all affected employees, respirator fit testing and training, monitoring, the need to develop effective engineering controls, additional record keeping etc. The best way to avoid these time-consuming requirements is to control employee exposure to airborne contaminants now, by the proper use of water sprays, control booths, ventilation and other means to keep employee exposure to dust to a minimum.

(b) The 8-hour time weighted average airborne concentration of asbestos dust to which employees are exposed shall not exceed 2 fibers per milliliter greater than 5 microns in length, as determined by the membrane filter method at 400-450 magnification (4 millimeter objective) phase contrast illumination. No employees shall be exposed at any time to airborne concentrations of asbestos fibers in excess of 10 fibers longer than 5 micrometers, per milliliter of air, as determined by the membrane filter method over a minimum sampling time of 15 minutes. "Asbestos" is a generic term for a number of hydrated silicates that, when crushed or processed, separate into flexible fibers made up of fibrils. Although there are many asbestos minerals, the term "asbestos" as used herein is limited to the following minerals: chrysotile, amosite, crocidolite, anthophylite asbestos, tremolite asbestos, and actinolite asbestos. Employees shall be withdrawn from areas where there is present an airborne contaminant given a "C" designation by the Conference and the concentration exceeds the threshold limit value listed for that contaminant. MSHA will require a complete respiratory protection program (See Section 6 of this manual) where MSHA monitoring and analysis indicates that these standards cannot be met using feasible engineering and administrative controls.

56.9315 - Dust control

Dust must be controlled at muck piles, material transfer points, crushers, and on haulage roads where hazards to persons would be created as a result of impaired visibility.

62 (all Parts) – Noise Standard – See details in Section 4. The minimum requirement to comply with the Part 62 Noise standard is that the mine operator monitor (not necessarily measure) worker exposure to mine noise. Some common-sense suggestions that may minimize operator compliance cost follow:

Unless the mine operator already has noise measurement data on its workers from MSHA monitoring or from other sources such as equipment manufacturer data or data from similar equipment measured elsewhere, the operator must determine employee exposure. We suggest the operator purchase a low cost ($30 to $40) slow-response sound level meter which measures noise on the A scale from 80 to 140 dBA. Use this instrument to determine what, if any, noise sources on the minesite emit noise at levels above 85 dBA. If there are none, simply keep the measurement data on file to show it to the MSHA inspector when he/she requests it. You've fulfilled your requirements.

However, if sources above 85 dBA are found, the operator should try to make changes that reduce these sources to levels below 85 dBA, or restrict employees from working regularly or for extended times in these areas using posted warnings and other means. If the MSHA inspector makes measurements and finds that the 8-hour average noise exposure for any miner exceeds 85 dBA, the mine will probably be cited unless the miner has been enrolled in a hearing conservation program (HCP -- requirements include training, offering hearing protection, audiometric testing etc.). The citation will probably amount to $60 for each violation, unless the miner's 8-hour average exposure exceeds 90 dBA and the miner is not wearing hearing protection, where the violation may be considered S&S, and the fine may greatly increase.

When the operator finds sources of noise in excess of 90 dBA and there is any chance that the 8-hour average exposure of any miner exceeds 90 dBA, the operator should require that the potentially overexposed miners wear hearing protection and also meet the other requirements for those exposed over 85 dBA. When miners are exposed to 8-hour average noise in excess of 90 dBA, the mine operator must also implement feasible engineering controls or control overexposure by restricting access to the work area (posting the area or reducing hours of work in the area etc.).

Remember that the MSHA won't cite you for noise levels regardless of how high they are -- legal limits are based on the 8-hour average miner exposure. If workshifts are longer than 8 hours the limits are reduced (for simplicity, you may think of it this way: 16 hours at 90 dBA is equal to 8 hours at 95 dBA, so if you estimate an average of 85 dBA in an 8 hour test and a miner works 16 hours at this noise level, your estimate of his exposure should be increased to an 8-hour average of 90dBA – that is, the time a miner can be exposed is cut in half for each 5 dBA increase in the noise level).

If miners are thought to be exposed to sources in excess of 105 dBA, these miners should be required to wear double hearing protection and all 90 dBA overexposure requirements must also be met. An exposure to 105 dBA for 1 hour is equal to an exposure of 90 dBA for 8 hours (Legal Limits: 90 dBA = 8 hours, 95 = 4 hours, 100 = 2 hours, 105 = 1 hour etc.). Any additional time of exposure over 90 dBA is over the legal limit. For example, if the miner is exposed to 105 dBA for 1 hour, he cannot legally be exposed to any more noise over 90dBA for the remainder of the workday, regardless of the hearing protection used (***MSHA can issue p-code exemptions when they determine that control is not feasible***). No miner can ever be exposed to noise levels in excess of 115 dBA. regardless of the amount or type of hearing protection worn.

HOISTING

56.9317 - Suspended loads

Persons must stay clear of suspended loads.

HOUSEKEEPING

56.20003 - Housekeeping
At all mining operations -(a) Workplaces, passageways, storerooms, and service rooms shall be kept clean and orderly; (b) The floor of every workplace shall be maintained in a clean and, so far as possible, dry condition. Where wet processes are used, drainage shall be maintained, and false floors, platforms, mats, or other dry standing places shall be provided where practicable; and (c) Every floor, working place, and passageway shall be kept free from protruding nails, splinters, holes, or loose boards, as practicable.

56.16001 - Storage of supplies
Supplies shall not be stacked or stored in a manner, which creates tripping or fall-of-material hazards.

56.20008 - Toilet facilities
Toilet facilities shall be provided at locations that are compatible with the mine operations and that are readily accessible to mine personnel. The facilities must be kept clean and sanitary. Separate toilet facilities shall be provided for each sex except where toilet rooms will be occupied by no more than one person at a time and can be locked from the inside. Toilets should be located where moving equipment does not endanger workers going to or from them.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

MSHA considers engineering controls which eliminate the hazard to be the best approach to controlling hazards. However, when a mine operator demonstrates that engineering controls are not feasible, MSHA may allow alternative solutions. The second priority for alternative control is administrative control. An example of an administrative control is removing an employee from the danger such as posting and barricading an area to prevent employees from entering it, or in the case of a health hazard, to limit the amount of time the employee can spend in the areas affected. When neither engineering nor administrative controls are feasible, MSHA may require a mine operator to use PPE. Under these conditions, PPE is viewed by MSHA to be only a temporary solution for use while suitable engineering controls are being developed. Certain PPE (head, eye, foot) are almost always required by company policy in all mine areas except offices.

56.5005 – Respiratory protection program/fit-testing ***See also 56.5001 under "HEALTH"***
A respiratory protection program including fit testing is required if over-exposure is found during MSHA health sampling (See Section 6 concerning a respiratory protection program for silica dust). The requirement to monitor is not enforced/required by MSHA if no overexposure is found. Respirator use in an "Immediately Dangerous to Life and Health (IDLH)" atmosphere requires another person standing by with backup and rescue capability.

56.15005 - Fall protection
Safety belts and lines shall be worn when persons work where there is danger of falling; a second person shall tend the lifeline when bins, tanks, or other dangerous areas are entered. ***Note -- Now that full-body harnesses are available, no one should ever use a safety belt for a fall arrest system, because a belt will likely kill the worker in stopping the fall. Minimum acceptable fall arrest equipment includes: an anchor point that will support at least 5000 lbs, a shock-absorbing lanyard, and a full-body harness. The anchor point should always be at least shoulder height to limit the force on the worker when the fall is arrested and the lanyard***

should be short to limit the distance and fall-arrest forces). Belts and lifelines may be suitable for fall-<u>prevention</u>, but not for fall-<u>arrest</u> systems.

56.15003 - Footwear
All persons shall wear suitable protective footwear when in or around an area of a mine or plant where a hazard exists which could cause an injury to the feet. ***Note that rubber boots offer significant protection against electrocution during ground faults, when working around low-voltage electrically powered equipment.***

56.15004 - Glasses
All persons shall wear safety glasses, goggles, or face shields or other suitable protective devices when in or around an area of a mine or plant where a hazard exists which could cause injury to unprotected eyes.

56.15002 - Hard hats
All persons shall wear suitable hard hats when in or around a mine or plant where falling objects may create a hazard. ***Note that there are various types of hard hats which offer protection against different hazards.***

RECORDS & EXAMINATIONS – See Table in Section 3 for a more complete list

Some of the Parts of 30 CFR requiring records and examinations are listed below along with the Standard's requirements:

50.20 - Accident, Injury and Illness Report - MSHA Report Form 7000-1 – Requires preparation and submission (details are presented in Section 8).

56.13015(b) - Compressed Air receiver inspection - Inspected by holder of valid National Board Commission in accordance with National Board Inspection Code, a Manual for Boiler and Pressure Vessel Inspectors, 1979 -- For receivers >250psi and >15 cu ft.

56.12028 - Electrical continuity and resistance of grounding systems - record of testing and results of most recent test are required. Test must be done immediately after installation, repair, and modification; and annually (see Section 10).

56.18010 – **Person trained in in Advanced first aid** – see under "EMERGENCIES".

56.4201 - Hydrostatic testing - Certifications of hydrostatic testing shall be retained until the fire extinguisher is re-tested or permanently removed from service. Some extinguishers must be hydrostatically tested (replacement may be a better option!) every 5 years and others every 12 years (see table accompanying 56.4201). Other certifications shall be retained for one year.

41.11 to 41.30 - Identity (Legal) of operator - MSHA must be notified in writing of legal identity of operator or any changes within 30 days using form 2000-7 "legal identity report".

45.4 - Independent contractor list - Requires independent contractor to provide the production-operator certain written information including identification, description of work, MSHA ID number, address of record etc. The production operator must have this information available at the mine for MSHA.

56.14100 (a) - Inspection of self-propelled mobile equipment for defects - records of inspections and certifications. - Equipment must be examined for defects by the equipment operator each shift before operating. The record listing any defects found must be kept until the defects are corrected.

56.18002(a) - Inspection of working places - Inspection of working places once each shift by competent person. (b) - Records of examination - Requires record of examination to be kept for at least a year. Part (c) of this regulation requires immediate withdrawal of persons if an imminent danger is found.

56.1000 - Notice of commencement or closing - MSHA must be notified in writing of either commencement or closing of mine. A phone call notifying MSHA is acceptable at many MSHA field offices.

56.13030 Pressure vessel inspection - Inspected by holder of valid National Board Commission in accordance with National Board Inspection Code, a Manual for Boiler and Pressure Vessel Inspectors, 1979 -- Not typically applicable to household type water heaters, etc.

50.30 - Quarterly Employment and Coal Production Report - MSHA Form 7000-2-Requires preparation and submission (See details in Section 8 of Manual).

40.1 to 40.5 - Representative of miners - How a person becomes a miner's representative and requirements of position. Mine operator must keep up-to-date information posted.

56.12028 - Testing for continuity and resistance of grounding systems - Test these systems immediately after installation, repair, and modification; and annually. Requires available record of the resistance (impedance for AC systems) measured during the most recent tests. This also applies to power cords etc. (See Section 10).

56.4201 (a) (1,2,3) - Fire extinguisher inspection - records required - (monthly check for full charge and operability) and annual maintenance checks), also must meet hydrostatic testing schedule in standard.

56.4201(a)(4) - Other fire fighting system quarterly inspection and annual use tests.

56.4201(a)(5) - Fire suppression system annual inspection based on the manufacturer's specifications to determine that system remains functional. Surface fire suppression systems are exempt from these inspection requirements if the systems are used solely for the protection of property and a fire would affect no persons.

56.4201(b) - Records of inspections and certifications of hydrostatic testing are required for fire extinguishers of the pressurized type.

TRAINING

46 & 48 (All) - Safety Training and Retraining (See Section 7 in this manual for details)
A company Training Plan is required for Part 46 Training (Call Dave Carlson – 906-487-2453 for assistance in preparing your training plan). Every mine or mining contractor subject to Part 46 Training Requirements must have an approved Part 46 training plan on file. For Part 48

training, a company doesn't need its own training plan and may train under the certified trainer's training plan (Dave Carlson – 906-487-2453). Required training includes 8 hours of Annual Refresher Training each year, New Inexperienced Miner Training, New Experienced Miner Training, Independent Contractor Training, Site Specific Hazard Awareness Training, and New Task Training.

Section 3
Recordkeeping Regulations

Action Items

Recordkeeping

1. Go through the table of records and mark those that apply to your operation.
2. Mark those that apply on your calendar.
3. Take immediate action on current record deficiencies (or assign to others & check that they are done) and take action on the others before the required date(s).
4. Call _____ at the local MSHA field office to answer questions.

Records Required by MSHA for Surface Metal/Nonmetal Mines

Disclaimer -- The material presented is only as accurate as we were able to obtain in preparing this table. 30 CFR and the Program Policy Manual Should be Consulted Also.

Record Required	Regulation	MSHA Form Number	Where to Find Forms & Other Info.	Timeline	Oper. Retention time	Additional
Accident investigation report - Company with 20 or less employees, may qualify to do investigation on form 7000-1 if injury not related to accident. Otherwise, do separate investigative report & complete 7000-1. Read 50.11 Subpart b.	Part 50	Form 7000-1	http://www.msha.gov/forms/forms.htm	Within 10 working days of reportable incident.	5 years	Read 50.11 Subpart b
Compressed Air receiver inspection - Inspected by holder of valid National Board Commission in accordance with National Board Inspection Code, a Manual for Boiler and Pressure Vessel Inspectors, 1979 -- For receivers >250psi and >15 cu ft.	56.13015	Inspector's certificate	Code available at MSHA District Office	Typically annually.	Progressive record --No limit	
Contractor Information in writing at the mine - 1) Contractor's trade name, business address and business telephone number; 2) description or nature of work to be performed and location at mine; 3) MSHA identification number, if any; and 4) Address of record.	Part 45.4	None given	N/A	Whenever contractor first works or when information changes	Keep at mine for Current Contractors	
Crane boom charts, boom angle indicator charts		None given	N/A	While in Use	While in Use	

Records Required by MSHA for Surface Metal/Nonmetal Mines Continued

Record Required	Regulation	MSHA Form Number	Where to Find Forms & Other Info.	Timeline	Oper. Retention time	Additional
Electrical continuity/resistance of grounding systems tests -- Continuity of equipment grounding conductors (< 1 ohm for safety), grounding electrodes (for ground rod or matt to earth, use fall of potential method for earth ground resistance) < 25 ohms by code or drive in another electrode (but for safety it is highly recommended to be < 5 ohms).	56.12028	None given	N/A	After installation, repair, modification - Annually after	Until next test	Good idea to keep progressive record to see resistance increases over the years. Read vol. IV, 56/57 12028 of MSHA Program Policy manual.
Emergency Telephone Numbers Posted at Appropriate Telephones	56.18012	None given	N/A	Always	While men are working	
Emergency firefighting, evacuation, and rescue procedures coordinated in advance with available firefighting organizations, fire alarm procedures or systems to promptly warn every person who could be endangered by a fire, and fire alarm systems maintained in operable condition	56.4330	None given	N/A	While men working	While men are working	Page 74 of MTU Supervisor Manual
Fire extinguisher - Hydrostatic test -- all extinguishers according to Manufacturer's Specs or Table in 56.4201	56.4201(a)3	Dated certif.	Table C in 56.4201.		Until retesting!	See manufacturer's specs on most modern extinguishers.
Fire extinguisher - Monthly check - visual inspection for full charge and operable condition. Knowledgeable person dates and initials form for each extinguisher	56.4201(a)1		N/A	Once during the calendar month	1 year	Knowledgeable person determines that it is operable.

Records Required by MSHA for Surface Metal/Nonmetal Mines Continued

Record Required	Regulation	MSHA Form Number	Where to Find Forms & Other Info.	Timeline	Oper. Retention time	Additional
Fire extinguisher - Yearly check - At least once every twelve months, maintenance checks shall be made of mechanical parts, the amount and condition of extinguishing agent and expellant, and the condition of the hose, nozzle, and vessel to determine that the fire extinguishers will operate effectively. Knowledgeable person dates and initials form for each extinguisher	56.4201(a)2		N/A	Every 12 months	1 year	Knowledgeable person performs maintenance and determines that it is operable.
Fire Suppression System annual inspection (only where persons are working)	56.4201(a)5	Dated certif.	N/A	Every 12 months	1 year	Tested according to manufacturer's certification to ensure correct working.
Firefighting Equipment - Other	56.4201(a)4	Dated certif.	N/A	Every 3 months	1 year	
First Aid Training – Advanced – Requires trained person to be available at all times and that training be available to all interested miners.	56.18010	Training Program Certificate (or rosters)	N/A	As necessary, depending on training course used -- typically once every 3 years.	Until next FA training	
Hazard Communication	Part 47	Written Program, MSDSs, labels, and record as part of new miner, new exp. miner, and new task Training.	N/A	Always required as part of new miner, new exp. miner and new task training where hazardous chemicals are involved in task.		

Records Required by MSHA for Surface Metal/Nonmetal Mines Continued

Record Required	Regulation	MSHA Form Number	Where to Find Forms & Other Info.	Timeline	Oper. Retention time	Additional
Hazard Communication -- Toxic Materials Labeling --Toxic materials used in conjunction with or discarded from mining or milling of a product shall be plainly marked or labeled so as to positively identify the nature of the hazard and the protective action required.	57.20012					
Hearing conservation Program (HCP – only where 85 dBA 8 hour TWA noise overexposure is found) - Noise Monitoring -- Noise Measurement Record	62.110	None	Download forms at http://www.mine-safety.mtu. edu	See Generic HCP – Section 4	During entire employee tenure + 6 months	
Hearing Conservation Program (HCP -- only where noise overexposure found) - Copy of written employee notif of overexposure and corrective action (keep 6 mo. after exposure ceases),	Part 62	None	Download forms at http://www.mine-safety.mtu. edu	See Generic HCP – Section 4.	6 months after situation corrected	
Hearing Conservation Program (HCP-- only where noise overexposure found) Audiometric test record w/in 30 calendar days of test (5 elements - suggest employee date of birth also)	62.172 Subpart (a4)	None	Download forms at http://www.mine-safety.mtu. edu	See Generic HCP – Section 4	During entire employee tenure + 6 months	
Hearing Conservation Program (HCP-- only where noise overexposure found) - Employee notif. of audiometric test results -- incl results, interp, findings of STS or RHL + need and reason for further testing or eval.+ need and reason for further testing or eval. (7000-1 accident report sent in if RHL)	62.175	None	Download forms at http://www.mine-safety.mtu. edu	See Generic HCP – Section 4.	As long as exposed & 6 mo thereafter	

Records Required by MSHA for Surface Metal/Nonmetal Mines Continued

Record Required	Regulation	MSHA Form Number	Where to Find Forms & Other Info.	Timeline	Oper. Retention time	Additional
Hearing Conservation Program (HCP--only where noise overexposure found) - Copy of written notice that employee put into HCP	62.110 (d),(e)	None	Download forms at http://www.mine-safety.mtu. edu	See Generic HCP – Section 4. Written notice required within 15 calendar days	As long as exposed & 6 mo thereafter	
Hearing Conservation Program (HCP--only where noise overexposure found) - Most recent training record (renewed every 12 months while miner enrolled in HCP -- 7 elements covered), document must certify date and type completed.	62.180	None	Download forms at http://www.mine-safety.mtu. edu	See Generic HCP – Section 4. Training within 30 days of enroll-ment & every 12 months.	Employee tenure + 6 mo.	
Notification before commencement or closing of mines -- Date, mine name, location, company name, mailing address, person in charge, and if operation is continuous or intermittent	56.1000	Letter, fax, or phone call	N/A	Before activity		
Notification of Legal Identity - Completed form sent to MSHA District Manager	Part 41	Form 2000-7	http://www.msha.gov/forms/forms.htm	Within 30 days of opening mine and whenever information provided changes.		
Pressure vessel inspection - Inspected by holder of valid National Board Commission in accordance with National Board Inspection Code, a Manual for Boiler and Pressure Vessel Inspectors, 1979 -- Not typically applicable to household type water heaters, etc.	56.13030	Inspector's certificate	N/A	Annually	Progressive record --No limit	

Records Required by MSHA for Surface Metal/Nonmetal Mines Continued

Record Required	Regulation	MSHA Form Number	Where to Find Forms & Other Info.	Timeline	Oper. Retention time	Additional
Quarterly Employment Report -- In no later than 15 days past end of quarter – by Apr. 15, July 15, Oct. 15, and Jan 15.	Part 50; Subpart D	Form 7000-2	See Section 8 & also http://www.msha.gov/forms/forms.htm	Quarterly within 15 days after end of calendar quarter.	5 years	Dates
Representative of Miners -- person or organization which represents two or more miners for safety and health who is authorized by the miners -- info must be submitted to MSHA District Office by miner's rep. and posted by mine indefinitely.	40.3, 40.4, 40.5	Representative submits info in 40.3 to District Office.	Company's only responsibility is posting and maintaining the information presented to MSHA in current status.	Whenever Applicable	Posting must remain while miner's rep. exists.	Representative. if one exists, is elected by miners. .
Respirator program (required whenever MSHA finds an overexposure to dust) -- A program for selection, maintenance, training, fitting, supervision, cleaning, and use – minimum reqts: (a) Respirators approved by NIOSH under 42 CFR part 84 which are applicable and suitable for the purpose intended shall be furnished and miners shall use the protective equipment in accordance with training and instruction. See MSHA's Program Policy Manual (b) A respirator program consistent with the requirements of ANSI Z88.2-1969, published by the American National Standards Institute and entitled "American National Standards Practices for Respiratory Protection ANSI Z88.2-1969," approved August 11, 1969, which is hereby incorporated by reference and made a part hereof.	56.5005			Respirators for respirable dust are required when a mine has been cited by MSHA for overexposure.	Until condition is corrected	See written program

Records Required by MSHA for Surface Metal/Nonmetal Mines Continued

Record Required	Regulation	MSHA Form Number	Where to Find Forms & Other Info.	Timeline	Oper. Retention time	Additional
Respirator program Continued: (c) When respiratory protection is used in atmospheres immediately harmful to life, the presence of at least one other person with backup equipment and rescue capability shall be required in the event of failure of the respiratory equipment. See MSHA's Program Policy Manual						
Rock Bolts Certification & Testing -- Manufacturer's certif.. and actual rock bolt testing at mine -- see exceptions in reg.	56.3203			Whenever Applicable	While using that bolting system.	
Safety Defect Log (for mobile equipment)	56.14100(d)	Flexible format		Daily -- pre-shift.	Until defect fixed	
Training P 46 -- **Annual Refresher** -- Need training plan, record of training (like lesson plan) consistent with training plan, certificate which could include the record of training.	Part 46	5000-23 correctly-modified or other form containing information required in Part 46 standard.	http://www.msha.gov/forms/forms.htm	Yearly - During month in which trained previous year	2 years	
Training P 46-- New Miner, Task, & Hazard; -- Need training plan, record of training (like lesson plan) consistent with training plan, certificate which could include the record of training.	Part 46	5000-23 correctly-modified or other form containing information required in Part 46 standard.	http://www.msha.gov/forms/forms.htm	Whenever applicable	Tenure of employment + 60 days	

Records Required by MSHA for Surface Metal/Nonmetal Mines Continued

Record Required	Regulation	MSHA Form Number	Where to Find Forms & Other Info.	Timeline	Oper. Retention time	Additional
Training P 48 -- Annual Refresher -- Training plan (or certified trainer's plan) w/copies to miner's rep., MSHA-approved instructors, 5000-23 certificate. When done in segments, initial and date topic(s) on form for each segment of training -- Prog. Policy Manual.	Part 48	Form 5000-23 or other form approved by MSHA	http://www.msha.gov/forms/forms.htm	Yearly - During month in which trained previous year.	2 years	
Training P 48 -- New Miner, Task, and Hazard Training --Training plan (or certified trainer's plan) w/copies to miner's rep., MSHA-approved instructors, Initial and date topic(s) on form for each segment of training -- Prog. Policy Manual	Part 48	Form 5000-23 or other MSHA-Approved form	http://www.msha.gov/forms/forms.htm	Whenever applicable	While worker employed + 60 days after leaving	
Training Plan	Part 46/48		Mich. Tech. has generic plan -- phone or email Dave Carlson (906/487-2453 or dcarlson@mtu.edu)	Once - post 2 wks before use	Whenever miners are working	
Training Plan Revisions -- All Part 48 plan revisions must be approved by District Manager. All Part 46 revisions must be posted 2 weeks before training.	Part 46/48			Whenever Applicable - post 2 wks before use.	Whenever miners are working	
Work Area Inspection (daily) by competent person - (1) date; (2) examiner's name; and (3) working places examined	56.18002	Your own forms		Daily	1 yr. or next inspection. (Operator must certify that they were discarded)	

Section 4
Hearing Conservation Program

Action Items

Hearing Conservation

1. Determine worker noise exposure and then record. (Records must be made available to MHSA inspectors.) Use one of the following methods:
   a. MSHA Data: Obtain from Inspector or get earlier MSHA data from MSHA home page (www.msha.gov) – see "Data Retrieval System" (http://www.msha.gov/drs/drshome.htm).
   b. Equipment manufacturer's data.
   c. Data from similar equipment, but be ready to explain why you think the equipment is similar (and therefore, the data are valid.)
   d. Use an SLM or Dosimeter to do your own measurements.
   e. Call Dave Carlson at 906/487-2453 or email dcarlson@mtu.edu for Assistance.
2. Determine which workers' exposures exceed the Action Level/Permissible Exposure Limit, and who needs to be enrolled in your Hearing Conservation Program. If none exceed the Action Level, you are done. Simply file your results so you have them when MSHA shows up.
3. If a worker's 8 hr time-weighted-average level exceeds 85 dBA, follow the summary of actions you may take on the following page. Send notification letter to overexposed worker.
4. If you need to enroll workers in a hearing conservation program, complete the Generic Hearing Conservation Program form in this manual and follow the steps in the program (including training, audiometric testing, hearing protection, installation of feasible engineering and administrative controls, notifications, and recordkeeping).

Part 62 Compliance – How to Comply in a Cost-Effective Way

The minimum requirement to comply with the Part 62 Noise standard is that the mine operator monitor (not necessarily measure) worker exposure to mine noise. Some common-sense suggestions that may minimize operator compliance cost follow:

- Unless the mine operator already has noise measurement data or data from other sources such as equipment manufacturer data or data from similar equipment measured elsewhere, the operator must determine employee exposure. We suggest the operator purchase a low cost ($30 to $40) slow-response sound level meter which measures noise on the A scale between 80 and 140 dBA. Use this instrument to measure the decibel level from all noise sources people are exposed to on the mine site. Determine which, if any, noise sources emit noise at levels above 85 dBA. If there are none, simply keep the measurement data on file to show it to the MSHA inspector when he/she requests it. You've fulfilled your requirements.

- However, if sources above 85 dBA are found, you may still need to do nothing more. You should, however, either try to make changes that reduce these sources to levels below 85 dBA, or restrict employees from working regularly or for extended times in these areas using posted warnings and other means. Remember that every 5 dBA increase in noise level above the limit cuts the allowable exposure time in half. Thus a very short exposure to very loud noise can cause a worker, who is otherwise working in a quiet environment, to be overexposed.

- If the MSHA inspector makes measurements and finds that the 8-hour average noise exposure for any miner exceeds 85 dBA, the mine will probably be cited, unless the miner has been enrolled in a hearing conservation program (HCP -- requirements follow in this section). The citation will probably amount to $60 for each violation, unless the miner's 8-hour average exposure exceeds 90 dBA and the miner is not wearing hearing protection, which may make the violation S&S, where the fine could greatly increase.

- When the operator finds sources of noise in excess of 90 dBA and there is a chance that the 8-hour average exposure of any miner exceeds 90 dBA, the operator should require that the potentially overexposed miner wear hearing protection and also meet the other requirements for those exposed over 85 dBA. The mine operator must also implement feasible engineering controls or control overexposure by restricting access to the work area (posting the area or reducing hours of work in the area etc.).

- Remember that the inspector won't cite you for noise levels on the minesite, regardless of how high they are. Legal limits are based, not on the noise level, but on the 8-hour average noise level to which the miner is exposed. If workshifts are longer than 8 hours the limits are reduced (for example, 16 hours at 90 dBA is equal to 8 hours at 95 dBA. If you determine that the 8-hour average exposure is 85 dBA and the miner works 16 hours at this noise level, your estimate of his exposure should be increased to 90dBA – or, put in different words, the time a miner can be exposed is cut in half for each 5 dBA increase in the noise level).

- If a miner is thought to be exposed to noise in excess of 105 dBA, this miner should be required to wear double hearing protection (plugs and muffs) and all 90 dBA overexposure legal requirements must also be met. An exposure to 105 dBA for 1 hour is equal to an exposure of 90 dBA for 8 hours (Legal Limits: 90 dBA = 8 hours, 95 = 4 hours, 100 dBA = 2 hours, 105 dBA = 1 hour etc.). Any additional time the miner is exposed to noise in excess of 90 dBA is over the legal limit. No miner can ever be exposed to noise levels in excess of 115 dBA, regardless of the amount or type of hearing protection worn.

Hearing Conservation – Questions and Answers to Inform You of What is Required

1) MSHA requires that mine operators monitor worker exposure to noise. T__, F__. ***True -- Monitoring is not the same as measuring. The mine operator has various options including: a) actual measurements, b)using data from similar equipment, c) using data MSHA has taken, d) using equipment manufacturer data.***

2) What is required when the 8-hour time-weighted average exposure for a worker is greater than 85 dBA? ***When the 85 dBA "Action Level" is exceeded, the miner must be enrolled into a hearing conservation program and offered hearing protection. The miner must wear this hearing protection if the baseline (first) audiometric testing will <u>not</u> be done within 6 months of enrollment or if an annual audiogram indicates that the miner has incurred a Standard Threshold Shift (10 dB shift) in a miner's hearing as determined by averaging the results measured at 2000, 3000 and 4000 hertz. The use of hearing protection does not eliminate the need to take the other required actions.***

3) What is required when the 8-hour time-weighted average exposure for a worker is greater than 90 dBA? ***In addition to the requirements for exceeding 85 dBA, when the 90 dBA permissible exposure limit (PEL) is exceeded, the operator must require that the hearing protection be worn and must also implement feasible engineering or administrative controls. The use of hearing protection does not eliminate the need to take the other required actions.***

4) What is required when the 8-hour time-weighted average exposure for a worker is greater than 105 dBA? ***In addition to the requirements for exceeding 90 dBA, the operator must require that dual hearing protection (plugs and muffs) be worn. The use of dual hearing protection does not eliminate the need to take the other required actions.***

5) What is the maximum sound level a miner can be exposed to? ***If a 30-second test indicates the miner is exposed to more than 115 dBA, the exposure level is out of compliance – the miner must never be exposed to this level of noise with or without hearing protection.***

6) Which of the following are correct? Noise-induced hearing loss a) can be prevented by reducing the time exposed to noise that is too loud (over 85 dBA), b) is reversible, c) can be prevented by wearing adequate hearing protection. ***a and c are correct.***

7) What is the permissible exposure limit (PEL) for noise? ***The PEL for noise is a 100 % dose equal to a noise level of 90 dBA for 8 hours, 95 dBA for 4 hours, 100 dBA for 2 hours, 105 dBA for 1 hour etc.***

8) If the 8-hour time-weighted-average noise exposure level (TWA) for a miner is over 90 and increases by 5 dBA, the time the miner can legally work in the noisier area decreases by how much? ***By 50 % or 1/2.***

9) If the length of the miner's workshift doubles, the time-weighted-average noise level above 90 dBA to which the miner can be exposed is decreased by ____ dBA. ***By 5 dBA.***

10) Does MSHA regulate: a) mine noise or b) miner exposure to mine noise? ***MSHA does not regulate mine noise. The law requires that every mine either have data that shows that the 8-hour time-weighted-average exposure of every miner is below 85 dBA, or that the appropriate action be taken***.

11) Pick the correct items -- A miner who is put into a hearing conservation program must a) be monitored b) be offered hearing protection, c) be offered audiometric testing, d) receive hearing conservation training. ***All are correct***.

12) Pick the incorrect items -- An audiometric test: a) provides a record over a number of sound frequencies of how loud noise must be for you to hear it, b) corrects your hearing problems, c) lets you and the mine operator know how fast you are losing your hearing, d) helps the operator determine if your hearing loss is work related, e) provides the operator with information needed to assess the effectiveness of controls, f) is automatically sent to MSHA***. b and f are incorrect. Data are reported to MSHA by the mine operator, only when an annual audiogram reveals a 25 dB shift in a miner's hearing as determined by averaging the results measured at 2000, 3000 and 4000 hertz.***

13) What is a standard threshold shift. ***A standard threshold shift occurs when an annual audiogram reveals a 10 dB shift in a miner's hearing as determined by averaging the results measured at 2000, 3000 and 4000 hertz***

14) When is hearing protection of importance to protect a miner's hearing? ***Whenever the miner is exposed to loud noise (greater than 85 dBA), both on and off the job.***

15) Which of the following are advantages of ear muffs? a) glasses do not affect them, b) better to use in hot environment, c) less infections, d) easier to use, e) less costly, f) easier to carry and store. ***c and d are correct.***

16) Which of the following are advantages of ear plugs? a) Glasses do not affect them, b) better to use in hot environment, c) less infections, d) easy to use, e) less costly, f) easier to carry and store. ***a, b, e, and f are correct.***

17) Does MSHA require a certain noise reduction rating for ear plugs? ***No -- MSHA doesn't rely on the listed ratings, but requires that the products used by miners be commercial rated products.***

18) What care is required for hearing protectors? ***Reusable plastic plugs should be cleaned with soap and water, dried and stored in a clean, dry place. Replace them if they show signs of wear. For muffs, inspect the inner lining and replace them when there is evidence of wear, tears or cracks.***

19) How are ear plugs correctly installed? ***Follow the manufacturer's instructions.***

For disposable foam plugs these usually include:

- ***a. Wash and dry hands before inserting.***
- ***b. Use thumb and forefinger to roll into a small crease-free cylinder.***
- ***c. With the opposite hand, pull the upper back of the ear outward and upward.***
- ***d. Insert the plug and hold at least 10 seconds, giving it time to expand making a tight seal.***
- ***e. Don't worry about pushing the plug in too deep – it's too short to hurt you.***

Reusable plastic plugs are simply inserted by using the opposite hand to pull the upper back of the ear outward and upward and inserting the plug.

If you have a correct seal with plugs or muffs, your voice will sound louder and hollow. Try covering your ears completely with your hands to see what plugs or muffs should do.

20) How often does the operator need to determine your exposure to noise? ***Initially and then only when a change is made that may affect your noise exposure level. If noise exposure has not changed, further monitoring may not be necessary.***

21) How often does the operator need to provide hearing conservation training to people that are enrolled in an HCP. ***Within 30 days after enrollment in an HCP and once per year by the end of the same month it was done the previous year.***

22) Must a miner who is in an HCP be informed of noise measurement results? ***Yes – the miner must be informed in writing within 15 days of the measurements.***

23) Must a miner be informed of audiometric testing results and interpretation? ***Yes – the miner must be informed in writing within 10 working days of the mine receiving the results.***

24) What records must the operator have for MSHA? ***Records of annual HCP training for enrolled employees, records of audiometric testing and records of employee notification of audiometric testing results and of exposure determination results (including if the action, PEL or dual-hearing protection level was exceeded) and the corrective action the operator is taking.***

Generic Hearing Conservation Program

Developed by

Michigan Technological University

Dave Carlson & Phil Eggerding

Instructions for filling out Generic Company Hearing Conservation Program Policy

Page 1: General company information.
It is not necessary to fill out this page if this HCP Policy will be included as a subpart in a larger Company Policy Manual.

Page 2: 62.110 – Noise Exposure Assessment
Noise Exposure Assessment – Place a check mark by those noise assessment methods that will be used at your company.

Page 3: 62.160 – Hearing Protectors
Check off and fill in the information on the various types of hearing protectors that will be used at your mine.

Page 4: 62.170 thru 62.175 – Audiometric Testing
Check off whether your mine requires audiometric testing or not.
Check off method your company will use to do audiometric testing.

Hearing Conservation Program Check-List
This checklist is provided to aid you in assuring full compliance with the standard.

Forms
The following forms are available for use in your HCP. In the standard, MSHA does not specify the types of forms to be used. Some of these example forms would be better suited to large companies – others, to small companies.
Most of these forms may be downloaded from our web site at: www.mine-safety.mtu.edu.

1. Hearing Conservation Program Training Record – Used to record the HCP Training for single individuals.
2. Hearing Conservation Program Training Class Roster – can be used as a record of HCP training for a large group.
3. Record Of Baseline Audiometric Testing – Lists those employees who have been baseline tested.
4. Record of Annual Audiometric Testing – Lists the annual audiometric tests done on company employees.
5. Hearing Conservation Program Employee Enrollment Record (Comprehensive) – A form that can be used to track all HCP aspects of employees enrolled in HCP.
6. Employee Noise Exposure Record – A form used to track Noise exposure of a large number of employees.
7. Example Notification Letter – Exposure At Or Above AL – Sample Letter informing an employee of his/her noise exposure above the Action Level.
8. Example Notification Letter - - Exposure Above the PEL – Sample Letter informing an employee of his/her noise exposure above the Permissible Exposure Limit.
9. Example Notification Letter – Standard Threshold Shift Detected in Annual Audiometric Testing.

30 CFR Part 62 Hearing Conservation Program

GENERAL COMPANY INFORMATION

MSHA ID Number: _____

Company Name: _____

Company Address: _____

City, State & Zip Code: _____

Mine Name: _____

Person responsible for health and safety training at the mine (Name and Position)

Responsible Person: _____

Position/Title: _____

Phone Number: _____

E-mail (optional): _____

The attached Hearing Conservation Program complies with the following subparts of CFR 30:

62.110 – Noise Exposure Assessment

62.160 – Hearing Protectors

62.170 thru 62.175 – Audiometric Testing

62.180 – Training

62.190 – Records

62.110 – Noise Exposure Assessment

Noise Exposure Assessment

At least one of the following method(s) will be used to assess employee exposure to noise (All that apply are checked):

___ 1. Company self-assessment using a Sound Level Meter.

___ 2. Company self-assessment using a Noise Dosimeter.

___ 3. Mine Safety & Health Administration (MSHA) compliance sampling data. (Copies of all such data will be included in records kept for this Hearing Conservation Program.)

___ 4. Equipment manufacturer's noise specifications. (Copies of all such data will be included in records kept for this Hearing Conservation Program.)

___ 5. Data from similar equipment.

Observation of Monitoring

This mine will provide the miners and their representatives with an opportunity to observe noise exposure monitoring and will give them prior notice of the date and time monitoring will take place.

Miner Notification of Exposure

This mine will notify a miner in writing within 15 days when his or her noise exposure equals or exceeds the action level, permissible exposure level or dual hearing protection level (provided this mine has not notified the miner of a similar exposure within the prior 12 months.) A record of notification will be kept at the mine for at least 6 months after the overexposure situation is corrected.

62.160 – Hearing Protectors

Hearing Protectors

The following two Hearing Protection Devices will be routinely offered (at no cost) to employees requiring such devices at this company. ***The law requires two types of muffs and two types of plugs be offered.***

Hearing protection Device #1
Type:
___ In-Ear (Ear Plug) ___ Over-the-Ear (Ear Muff) ___ Ear Canal Cap
___ Other (Describe:)_____
Manufacturer: _____
Ordering Information: _____

Hearing Protection Device #2
Type:
___ In-Ear (Ear Plug) ___ Over-the-Ear (Ear Muff) ___ Ear Canal Cap
___ Other (Describe:)_____
Manufacturer: _____
Ordering Information: _____

Hearing Protection Device #3
Type:
___ In-Ear (Ear Plug) ___ Over-the-Ear (Ear Muff) ___ Ear Canal Cap
___ Other (Describe:)_____
Manufacturer: _____
Ordering Information: _____

Hearing Protection Device #4
Type:
___ In-Ear (Ear Plug) ___ Over-the-Ear (Ear Muff) ___ Ear Canal Cap
___ Other (Describe:)_____
Manufacturer: _____
Ordering Information: _____

In the event that the employee has a medical condition that prevents the use of the original choices offered the following additional choices will be made available.

Hearing Protection Device – Alternate #1
Type:
___ In-Ear (Ear Plug) ___ Over-the-Ear (Ear Muff) ___ Ear Canal Cap
___ Other (Describe:)_____
Manufacturer: _____
Ordering Information: _____

Hearing Protection Device – Alternate #2
Other devices recommended by the physician who determined that the original choices were not suitable.

Hearing Protector Training

Training will be done on provided hearing protectors within 30 days of enrollment in the Hearing Conservation Program and thereafter, during annual refresher training.

62.170 thru 62.175 – Audiometric Testing

Audiometric testing will be offered to employees whose noise exposure is at or above the Action Level. The choice checked below reflects this mine's policy on requiring audiometric testing.

___ This mine requires baseline audiometric testing as a condition of employment.
___ This mine does not require a baseline audiometric test as a condition of employment.

Baseline audiometric testing will be provided within 6 months of enrollment in the Hearing Conservation Program (12 months if mobile lab is used.) The choice checked below reflects this mine's policy on audiometric testing.

___ Audiometric testing will be performed by our mine operation. The following is the name of the qualified Audiometric testing person:

_____

___ The following Audiometric Testing Service will be used for testing of our employees.
Name of Audiometric Testing Service: _____
Address: _____
_____
Other Contact information: _____

Audiometric testing will be offered annually to all employees who have been baseline tested.

Employee Notification
(Sample Notification Letters are in the Forms found under “Noise” at http://www.mine-safety.mtu.edu.

Within 10 working days of receiving the results of an audiogram, or of a follow-up evaluation required under § 62.173 of Part 62, this mine will notify the miner in writing of the following:

1. The results and interpretation of the audiometric test, including any finding of a standard threshold shift or reportable hearing loss; and
2. The need and reasons for any further testing or evaluation, if applicable.

Note: When evaluation of the audiogram shows that a miner has incurred a reportable hearing loss as defined in Part 62, this mine will report such loss to MSHA as a noise-induced hearing loss in accordance with part 50 of 30 CFR. (Unless a physician or audiologist has determined that the loss is neither work-related nor aggravated by occupational noise exposure.)

62.180 – Training

Within 30 days of a miner's enrollment into the Hearing Conservation Program, this mine will provide the miner with training. This mine operation will give training every 12 months thereafter if the miner's noise exposure continues to equal or exceed the action level. Training will include:

1. The effects of noise on hearing.
2. The purpose and value of wearing hearing protectors.
3. The advantages and disadvantages of the hearing protectors to be offered.
4. The various types of hearing protectors offered by the mine operator and the care, fitting, and use of each type.
5. The general requirements of this standard.
6. The mine operator's and miner's respective tasks in controlling the miner's exposure to noise.
7. The purpose and value of audiometric testing and a summary of the procedures.

This mine will certify the date and type of training given each miner, and maintain a record of this training for as long as the miner is enrolled in the Hearing Conservation Program, and for at least 6 months thereafter.
(Sample Training Certificates are in Forms found under “Noise” at http://www.mine-safety.mtu.edu.

62.190 – Records

A person's access to this mine operations Part 62 records will be in accordance with 30 CFR Part 62.190.

Hearing Conservation Program Check-List

Any miner found to have a noise exposure on the 80 to 130dB scale of greater than or equal to 66% (50% with 2dBA error factor) will be included in a Hearing Conservation Program that meets the requirements established by 62.150.

Miner's Name: _____ AL %Dose: _____

Mine ID: _____ Event Number: _____ Date Sampled: _____

62.150 - Hearing Conservation Program Review

NOTE: After completion of this review or if you have any questions about compliance with any part of the "Hearing Conservation Program" requirements consult with the District Industrial Hygienist or Health Specialist.

62.110- Noise Exposure Assessment

YES / NO 62.110(a) Has the miner's noise exposure been evaluated by the mine operator? Note: If the operator has included the miner in a hearing conservation program without assessing exposure to the "Action Level" a citation may not be warranted.

YES / NO 62.110(d) Has the mine operator informed the miner in writing within the last twelve months of exposure determination?

62.160 - Hearing Protectors

YES / NO 62.160(a) Has the mine operator provided the miner with a selection of hearing protection at no cost.

62.170 through 62.175-Audiometric Testing

YES / NO 62.170 Has the mine operator offered to the miner an audiometric test at no cost?

YES / NO 62.170 Has audiometric testing been conducted every 12 months.

YES / NO 62.171 Is an audiometric test record maintained for the miner that documents: l) name and job classification, 2) copy of all audiograms, 3) evidence that the audiogram is scientifically valid, 4) any exposure determination, and 5) results of follow-up exams.

YES / NO 62.175(a) Has the mine operator provided, within 10 working days, the miner with a written record of the results of the audiogram.

YES / NO 62.170(b) Has a reportable hearing loss been incurred by the miner (25dBA reduction) and has a 7000-1 been filed with MSHA?

Date of Baseline Audiometric Test: _____

Date of Last Audiometric Test: _____

62.180 - Training

YES / NO 62.180(a) Has the mine operator trained the miner on I)effects of noise on hearing, 2)use, care, fitting of, advantages, disadvantages, and types of hearing protection devices 3)requirements of Part 62, 4)noise controls and 5)purpose and value of audiometric testing.

YES / NO 62.180(a) Has training been provided within 12 month of last HCP training.

YES / NO 62.180(b) Has the mine operator certified the date and type of training.

Date of Training: _____

Hearing Conservation Program Check-List (use when exposure at/above 66% dose)

EMPLOYEE SAMPLED: _____ **OCCUPATION:** _____

MINER IS ENROLLED IN HEARING CONSERVATON PROGRAM: YES NO (Circle One)
(If "NO" is circled, do not complete the remainder of this form)

DATE MINER ENROLLED IN HEARING CONSERVATION PROGRAM: _____

Basis for enrolling miner in Hearing Conservation Program (check one)
__ Miner enrolled in Hearing Conservation Program because exposure at or above Action Level; **OR**
__ Miner enrolled in Hearing Conservation Program even though monitoring indicates noise exposure less than Action Level; **OR**
__Miner enrolled in Hearing Conservation Program without monitoring

62.110 Noise Exposure Assessment (check if complied with)
__ System of monitoring evaluates noise exposure sufficiently to determine continuing compliance

NOISE EXPOSURE LEVEL DETERMINED BY MINE OPERATOR: _____

__ Miner who is exposed at or above Action Level, Permissible Exposure Level, or Dual Hearing Protection Level is notified in writing within 15 days (not required more than once per year)

DATE OF MINER NOTIFICATION: _____

62.160 Hearing Protectors (check if complied with)
__ Hearing protectors provided at no cost to miner
__ Hearing protectors in good condition, properly fitted, maintained
__ Mine operator insures miner wears hearing protectors when noise exposure equals or exceeds PEL

62.170 – 62.175 Audiometric Testing (check if complied with)
__ Baseline testing offered and provided within 6 months of enrolling in HCP (12 months for mobile lab)

MINER ACCEPTED OFFER OF AUDIOMETRIC TESTING: YES NO (Circle One)

IF MINER ACCEPTED OFFER, DATE OF BASELINE AUDIOGRAM: _____

__ Annual audiometric testing offered every 12 months thereafter

DATES OF ANNUAL AUDIOGRAMS: _____

__ Within 10 days of receiving audiometric test results, mine operator notifies miner in writing of results and interpretation of test and, if necessary, need and reasons for further testing or evaluation

NOTE: If any audiogram irregularity is observed, send all related records to District IH for review

62.180 Training (check if complied with)
__ HCP training provided within 30 days of enrollment in HCP, and at intervals not less than 12 months

DATE OF MOST RECENT HEARING CONSERVATION PROGRAM TRAINING: _____

62.190 Records (check if complied with)
__ AR given access to all required records within 24 hrs of request

Section 5
Communication – Key to Safety

Action Items

Communicating Safety

1. Establish a clear-cut, easy, and non-threatening method by which employees can make safety suggestions or register safety concerns.
2. Act promptly on all safety suggestions and respectfully inform those making the suggestions of your actions, whether or not you accept them. If you do not accept them, give the person(s) making the suggestion(s) a carefully thought-out, respectful explanation of your reasons.
3. At all times, tailor your words and actions to reflect full support of safety and safety suggestions. This is especially important when things need to get done in a hurry, a time when accidents are more likely to happen.
4. Give instructions for new or non-routine tasks to employees in the following manner to be 90% certain that what you want done is done safely and correctly:
   a. Tell the employee what to do and, if possible, show it being done correctly.
   b. Ask the employee to repeat the instructions back to you, and check to see if they are correct.
   c. Ask the employee if he/she sees any way to improve on these instructions, or how the task is to be done.
   d. Discuss suggested changes and agree on the final procedure.
   e. To the extent possible, have the employee demonstrate the correct procedure to you.
   f. Write down the agreed-upon steps or amend previously written procedures and include it in an alphabetized file of correct operating procedures.
5. Do not reward unsafe behavior. Punish employees who violate safety rules. (You will need careful preplanning of step-by-step disciplinary procedures and communication of these procedures to employees).
   a. Employees who display unsafe behavior must be disciplined as soon as practicable.
   b. Employees who make light of safety procedures or who in any way encourage others to ignore safe practices, must be disciplined immediately.

Questions & Answers – *Once You Understand the Reasons for The Answers Given, You Have the Opportunity to Make Great Progress in Both Safety and Efficiency.*

1. When an accident occurs the company should: a) ___Determine who is at fault and assess a fair penalty, b)[redacted] Search for the root cause and correct the problem, c) a & b ____
2. Accidents are, for the most part, the result of improper employee behavior. True ___, False [redacted]. *Employee behavior may be the immediately-observable cause, but employee behavior is usually determined by the importance management places on safe and healthy workplace engineering controls and practices*.
3. The best way to find out about hazards in your workplace is: a)___ Do the required walk-around inspection, b)___Read all MSHA regulations, c)[redacted] Establish open communication with all employees and convince them to discuss their safety-related concerns. *Experienced employees know best where the hazards are. They are the ones who, if not intimidated or belittled by supervisors or peers, can best describe dangerous jobs and close calls they have experienced, which is fundamental information for identifying needed improvements. If they fear that such discussion will lead to belittling remarks, they will withhold the information to protect themselves.*
4. For the most part, employees get hurt as the result of having a bad attitude, which is reflected in their work ethic. True ___, False[redacted]. *Accident statistics in the mining industry indicate that the most conscientious employees (those that companies promote into supervisory positions) have a high frequency of fatalities. These are the people who feel the need to get the job done and are often willing to risk their health or even their life to make it happen. They may also feel they are the only ones that can undertake dangerous tasks without getting killed.*
5. If the supervisor warns an employee about a hazard in clear English and the employee gets hurt by the hazard, it is clearly the employee's fault. True ___, False [redacted]. *You will understand this better after you read the answers to questions 6 through 11.*
6. When explaining something to an employee, you should expect him/her to retain: 10 %___, 20 %[redacted], 30 %___, 50 %___, 70 %___, or 90 %___.
7. If you give an employee something to read, you should expect him/her to retain: 10 %[redacted], 20 %___, 30 %___, 50 %___, 70 %___, or 90 %___.
8. If you explain something to an employee and draw a picture you should expect him/her to retain: 10 %___, 20 %___, 30 %___, 50 %[redacted], 70 %___, or 90 %___.
9. If you show an employee something you should expect him/her to retain: 10 %___, 20 %___, 30 %[redacted], 50 %___, 70___, or 90 %___.
10. If you get an employee to explain something back to you, you should expect him/her to retain: 10 %___, 20 %___, 30 %___, 50 %___, 70 %[redacted], or 90 %___.
11. If you get an employee to do something and explain how he/she did it, you should expect him/her to retain: 10 %___, 20 %___, 30 %___, 50 %___, 70 %___, or 90 %[redacted].
12. Safety improvements are most likely to result from: a)___ very detailed accident investigation, b)___establishment of the cause and determination of who is to blame,

c)[redacted] open-communication to determine hazards, prioritization to determine which ones to focus on, and continuous improvement. *While MSHA requires the company and inspectors to conduct detailed accident investigations, detailed accident investigation can easily turn into a "blame another – protect myself" game. In general, when an accident occurs, most people learn to keep silent to avoid losing or hurting friends, being blamed themselves, providing information for attorneys looking for easy money, etc., making this the most difficult time to look for the unbiased information required to make needed improvements.*

13. The decision to make safety improvements should: 1)___ require approval by as many levels of management as possible, 2)[redacted] require approval by as few levels of management as possible. *Think of it this way – if the first person can say yes or no you may have a 50 % chance of getting the job done, if his boss can say yes or no, it may drop to 1/2 of 50% or 25 %, if his boss can say yes or no it may drop to 12.5 % and so on. Furthermore, the likelihood of the suggestion dieing on someone's desk due to the person's other commitments increases with the number of approvers. Also the time it takes for an important safety suggestion to be implemented increases with each level of approval required. This is discouraging to the person(s) who made the suggestion who may conclude that "nobody really wants or cares about safety in this company".*

14. An accident which results from an employee behavior-related cause, is definitely the employees fault. True ___, False [redacted].

    The *employee may not be suited to the task assigned (nobody can do everything well). The employee may not be trained in the hazards and correct operating procedures for the task assigned. These are management responsibilities.*

    However, even if the employee knows all of the safe procedures (management's responsibility) and is told by management to be safe, any employee can read between the lines. For example, If an employee gets frowns or negative statements from the boss or co-workers about taking time to be safe or about suggestions to improve safety, or if he sees that those who take dangerous shortcuts are in management's favor, the employee will soon learn to modify his/her behavior. An employee wants his boss's approval regardless of whether or not he likes the boss.

    When the employee becomes discouraged, he/she will probably stop making suggestions and begin to eliminate steps required to do the job safely. To avoid this common occurrence, managers must take the time to communicate in a positive way with employees to arrive at safer and more efficient ways to do a job (two heads are far better than one). Over the long run, this strategy will pay big dividends in improved safety and efficiency as well as in the employees becoming contributors to both safety and efficiency. The employee will feel rewarded knowing that he/she is respected by management and is making a positive contribution to the company that is appreciated. The result will be a happier, safer and more efficient workforce.

15. Supervisor behavior has only a very small effect on safety in the workplace. True ___, False [redacted]

16. Clearly-written, step-by-step procedures that are safe should be followed for all tasks that have associated dangers and these procedures should never be changed. True ___, False

■ *The first part is true, but continuous improvement is the only way to a safe workplace.*

17. Competition between employees or employee groups is a good way to motivate employees to safer behavior. True ___, False ■. *Competition between employees or employee groups destroys cooperation in achieving company-wide goals and leads to obstructive behavior to achieve individual goals.*
18. Giving awards is a good way to promote safe behavior. True___, False ■. *Awards for meeting lost time quotas etc. are likely to lead to employees not reporting accidents or near misses that, if not communicated to the right people, could result in more devastating accidents at a later date.*

Supervisor Self-Assessment Eye Opener – Do I Reward Unsafe Behavior? If your response is the answer marked, give yourself credit for rewarding **unsafe** behavior. *You should conclude that rewarding **unsafe** behavior comes natural, but it takes careful thought and determination to truly reward safe behavior.*

1) Do you:
   a) Fail to express gratitude when an employee points out a safety concern? – Yes [redacted] No ___
   b) Fail to take immediate action when you are made aware of safety concerns? Yes [redacted] No ___
   c) Fail to communicate to the person who expressed a safety concern that action has been taken or respectfully convince the person that the action was not needed or a different action is needed? Yes [redacted] No___
   d) Praise the employee who gets the job done faster without regard for safety or criticize the employee who takes extra steps to ensure that safe practices are followed? Yes [redacted] No___
   e) Allow other employees to make remarks about safety-minded employees? Yes [redacted] No___
   f) Look with disdain at safety-minded employees because they "waste too much time worrying"? Yes [redacted] No___
   g) Fail to punish repeated unsafe behavior that the employee is clearly aware of? Yes [redacted] No___
   h) Set a bad example for your employees by taking chances? Yes [redacted] No___
   i) Complain about MSHA rules to your employees? Yes [redacted] No ___

2) Do you have an understanding with employees about actions that will be taken if safety rules are violated – for example, warning for the first offense, 3 day layoff for second, longer layoff for third, and discharge for continued disregard of rules? Yes ___ No [redacted]

3) Do you have clear procedures employees must follow when they find an unsafe condition or become aware of an unsafe practice? Yes ___ No [redacted]
   a) Are your employees instructed to stop operating equipment immediately when they have discovered a safety concern? Yes ___ No [redacted]
   b) Are employees who do not stop working when safety concerns arise punished? Yes ___ No [redacted]
   c) Is it easy for employees to contact you or a designated person as soon as they encounter a problem? Yes ___ No [redacted]
   d) Does the reporting mechanism allow the employee to report concerns privately to minimize inhibition due to peer pressure? Yes ___ No [redacted]

e) Is the employee who reports a safety problem with his equipment given a less-desirable job during maintenance activities or sent home without pay? Yes [redacted] No ___
f) Do you have a good preventive maintenance program? Yes___ No [redacted]
g) How many layers of management are involved in getting a safety suggestion approved? 1 ___, 2 [redacted], 3 [redacted], 4 [redacted]
h) Will following your example with respect to safety improve the liklihood that none of your employees are injured? Yes ___No [redacted]
i) Do you have a process in place for reviewing procedures used to conduct non-routine tasks that have associated dangers? Yes ___ No [redacted]
j) Do you become involved in all employee safety meetings? Yes ___ No [redacted]

4) Do you assign blame when one of your employees is involved in an incident? Yes [redacted] No ___
   a) Have your employees been adequately trained to follow procedures which would have made it possible to avoid the incident? Yes ___ No [redacted]
   b) Do the equipment or procedures you provide for your employees to use leave open the possibility of an accident occurring? Yes [redacted] No ___
   c) Are substance abusers allowed to work while under the influence? Yes [redacted] No ___
   d) Do you have a procedure for determining when a employee is not fit to work due to substance abuse, along with the corrective actions to take to avoid repercussions for the company? Yes ___ No [redacted]
   e) Are your employees genuinely encouraged to suggest improvements in work procedures and equipment to make their jobs safer? Yes ___ No [redacted]
5) Do you consider the time you spend with employees discussing safer and more efficient ways to do a job to be a valuable investment of your time? Yes ___ No [redacted]

Fundamentals That Will Improve Your Safety Performance

1. The proper foundation upon which good safety programs are built is genuine concern for the welfare of employees and their families. High costs resulting from accidents and safety violations provide additional incentive.
2. Open communication is essential to improved safety performance. Each employee must be at ease in communicating safety-related concerns without fear of reprisal or stigma. The best incentive for participation in the correction of safety-related problems is rewarding employees by timely action on their concerns. Even apparently frivolous concerns and unworkable suggestions must be considered carefully and responded to respectfully.
3. Blaming employees for accidents or injuries instills fear and distrust. This inhibits productive communication that is essential for accurately determining and correcting the causes of accidents and injuries. Blame for clear-cut criminal behavior is not included -- for example, if an employee comes to work drunk and runs over a fellow employee, criminal negligence can be established.
4. Avoid dependence on mass safety inspections to accomplish safety. Require instead statistical evidence that safety is built on. MSHA accident statistics may help initially in directing you to the areas of greatest concern, but gathering your own data is best.
5. If accident data are not available, investigate the motive for observed 'at-risk' behavior and adjust systems to compensate. Dig deep enough to identify your own responsibility and that of other managers in the matter.
6. Find problems. Target your safety performance using data on accident and injury trends, (and near misses, when available.)
7. Efforts toward improving a company's overall safety should begin by focusing on the tasks that produce the highest numbers of serious accidents.
8. No safety management system is ever perfect and all require continual improvement. It is the responsibility of management with the help of employees to work on continual improvement.
9. Bottlenecks to correction of safety problems should be eliminated. One serious bottleneck is the number of persons in the chain of command who must approve corrective action. Simple statistics reveal that the more persons there are in this chain; the lower is the probability that corrective action will be taken. The effect is that employee incentive to participate in the improvement process is quashed.
10. Supervisors must become leaders, facilitators, coaches and counselors of the safety-improvement process. Proper attitudes must be instilled on each new employee's first day at work and these attitudes will only remain if the actions and words of managers and supervisors are consistent and continue to sincerely encourage safety suggestions and improvement.
11. Most accidents and injuries result from management system problems rather than from employee behavior. Employee behavior may be viewed as a system problem. For example, the employee isn't self-hired to perform a particular task, is not self-trained, nor does the employee set the tone about the importance of safety in the company. Management can be indirectly responsible for building most of the barriers to safe behavior. If the system has the potential for a serious accident, in time a serious accident is likely to occur.
12. Where safety is not considered a high priority concern, and safety training is neglected, supervisors and conscientious, productive, employees who want to please their supervisors are likely to be the ones injured.

13. Clearly written, step-by-step procedures that are safe and efficient should be adhered to by all performing daily work tasks that have associated dangers. These procedures should be followed until safer procedures have been established. Safety and efficiency often go hand in hand.
14. Solutions to safety-related problems must not be "cast in concrete". All solutions are subject to improvement, the need for which should be based on frequent reviews and charting of incidence records.
15. Remove any barriers that would prevent the hourly employee from working safely. Eliminate the need for making choices of Quality vs. Production vs. Safety. All are important and none will be optimized if the others are ignored. Supervisors must always be looking for barriers to safe employee behavior, including employee fears about taking action on safety concerns that might require the stopping of production, or other action that would incur the anger of management or fellow employees.
16. Zero accidents is not an unreasonable goal because no one wants to be injured or killed. If you doubt this ask yourself – do I want to lose my eyes today?
17. Competition between employees or employee groups destroys cooperation in achieving company-wide goals and leads to obstructive behavior to achieve individual goals.
18. The need for choosing between safety and productivity should not exist. The word "production" should not be used without the adjective "safe". Continual improvement in safety is profitable.

Section 6
Respirator Program
Action Items

Respirator (Dust) Program

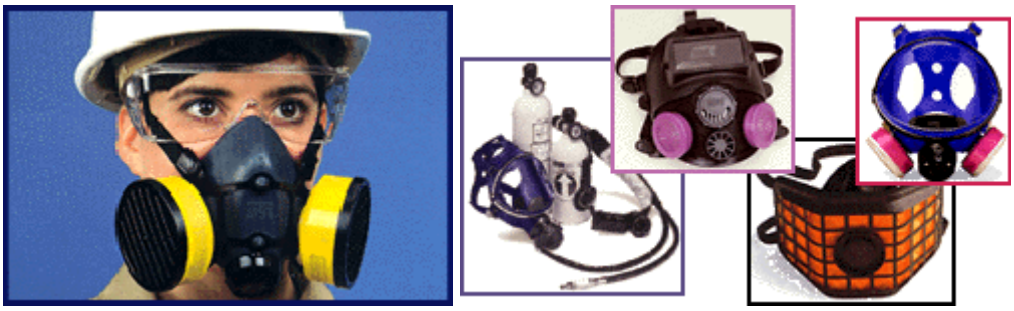
1. Eliminate worker exposure to dust. Your money is better spent on controlling dust exposure than on both controls and the respiratory protection program required after you receive an MSHA citation for overexposure.
2. If you are cited, follow the instructions in this section to complete the written Respiratory Protection Program and adhere to your written program.

1. Every mine must have a written respiratory protection program. True/***False.***
2. Respiratory protection standards enforced in metal/nonmetal mines were published in 1973. ***True***/False
3. MSHA requires miners who work near respirable dust to wear respirators. True/***False – MSHA does not regulate dust emissions. MSHA regulates worker exposure to dust emissions and requires that engineering controls be put in place when workers are overexposed. Respirators are required as part of a complete Respiratory Protection Program when a mine has been cited for overexposure. Respirators are considered by MSHA to be a temporary corrective measure only while feasible engineering controls are being developed.***
4. A good-quality air-purifying respirator will protect you from dust, harmful gasses, and harmful vapors. True/***False – You need respirators that are specially designed for the airborne contaminant your workers are exposed to.***
5. An air purifying respirator will protect you from oxygen deprivation. True/***False – An air purifying respirator only filters out the contaminant for which it is designed. It does not add oxygen to the air. For oxygen deprivation you need an air-supplying respirator.***
6. A self-contained breathing apparatus (SCBA) is an air purifying respirator. True/***False – A SCBA is an air-supplying respirator in a small package designed for emergencies, and some underground mines require that one be available for each miner. It provides clean air for a short period of time (usually about an hour) while the miner excapes from a hazardous atmosphere.***
7. The amount of harm from mineral dusts depends on the particle size and composition. ***True***/False – ***Particles that are most harmful are the invisible ones that are less than 10 microns. The amount of harm depends on what they contain. For example, the 8 hour time-weighted average worker exposure to some particles is limited to 5 mg/m3, while for crystalline quartz, for example, the limit is 0.1 mg/m^3.***
8. An air-line respirator is an atmosphere-supplying respirator. ***True***/False – ***air is supplied to the person through a specially designed regulator/hose/face mask system.***
9. Beach sand is largely crystalline quartz. ***True***/False – ***Beach sand is composed of crystalline quartz, but the particle size is too large to be of concern. If this sand were to be abraded into fine particles less than 10 microns, it would become the very toxic crystalline quartz that causes silicosis.***
10. Almost all mine products contain crystalline silica at concentrations greater than 1 %. ***True***/False – ***Crystalline silica, which is usually in the form of quartz, is found in almost all rock formations at concentrations in excess of 1%. However, it is the concentration of the very finely abraded (less than 10 micron) crystalline silica, which becomes airborne, that is of concern to workers. The standard is based on the concentration in the air the miners breathe and not the concentration in the ore that is mined.***
11. Mine products containing quartz at concentrations in excess of 1 % crystalline silica are considered to be hazardous chemicals. ***True***/False – ***When mine products contain more than 1 % crystalline silica, they are considered to be hazardous chemicals; the mine must have an MSDS for the product and train workers about its hazards and protective measures.***
12. Mine air averaging more than 0.1 mg/m^3 of crystalline silica is a violation of MSHA standards. True/***False*** – ***MSHA doesn't regulate the concentration in the mine air. MSHA regulates the amount a miner is exposed to and measures this by mounting a sampler on the miner for the entire workshift.***
13. Mine products containing quartz at concentrations in excess of 1 mg/m^3 require the use of a respirator. True/***False – MSHA doesn't regulate the amount in the mine product, but the amount in the air a miner is exposed to. However, the HazCom rule requires that when the mine product contains more than 1 % crystalline silica, the mine must have an MSDS available, on request, to miners and customers and train the miners in the hazards and protective measures.***

14. A miner who is exposed to mine air containing crystalline quartz at concentrations in excess of 0.1 mg/m^3 for 8 hours is in violation of MSHA standards. ***True***/False.
15. One major source of exposure to respirable dust is improper housekeeping and a poor choice of cleanup procedures. ***True***/False – ***As odd as this sounds, this is probably the major source of overexposure in many mines. The miner collects the fine toxic silica dust in his clothing and brings it into the lunchroom, office, vehicle cabs, control booths, his car, his home, etc. This dust collects in seat cushions, on the floors, walls etc. If fresh air is not continually ventilating this enclosed space, every movement the miner or others make, stirs up the fine crystalline silica dust, which is so fine that it remains airborne for hours. 1 teaspoon of this fine crystalline silica in the air inside a large great lakes ore carrier would cause the concentration in the air to exceed the level a miner can legally be exposed to over an 8-hour workshift.***
16. Hosing down the ore pile is a good way to reduce dust. ***True***/False – ***This would wash the fine silica dust from the rocks before they are transported to the next step in the process***.
17. Properly functioning water sprays at critical locations in conveying, crushing, screening and sizing operations can significantly reduce respirable dust emissions. ***True***/False – ***The placement of sprays is critical because each time a particle is crushed or abraded, new faces are exposed, which release the fine crystalline silica dust. The spray should preferably be directed at the particles while they are being crushed or abraded in other process steps.***
18. Dry dust control systems are ineffective. True/***False*** – ***Enclosed systems which draw the dusty air away are effective means of dust control.***
19. Operator isolation is an effective dust exposure control method, if applied correctly. ***True***/False – ***Operator isolation is effective if precautions are taken to ensure that dusty clothes are not worn into the control room or other operator station. Good housekeeping and effective ventilation with fresh clean air will help ensure that a buildup of fine crystalline silica in the operator's workspace does not occur.***
20. Operator isolation may contribute to overexposure. ***True***/False. ***If the abovementioned precautions are not taken, operator isolation may very well become a major contributor to operator overexposure to crystalline silica.***
21. Surface drills located out in the open air are a serious dust concern. ***True***/False – ***Inadequate dust controls on surface drills is a major source of operator overexposure to crystalline silica. MSHA is very concerned and issues numerous citations.***
22. Road dust is: a) a safety concern, b) a health concern, c) ***both a & b. While it is not the visible dust that causes silicosis, visible dust is unsafe because it limits operator visibility. Also, visible dust is an indication that the toxic respirable silica dust is also present in excessive concentrations.***
23. MSHA will usually not require you to do a dust survey unless you have been cited for an overexposure condition. ***True***/False
24. An MSHA citation usually brings with it the requirement that the mine operator begin to monitor dust and establish a respiratory protection program. ***True***/False
25. Monitoring dust can be done by anyone with a little training. True/***False*** ***Dust monitoring requires training and experience. Equipment is expensive and maintenance is time consuming. Meaningful results require extreme care in following carefully-designed procedures. MSHA uses only MSHA's sampling results to determine whether or not an overexposure condition exists. Once a mine is cited for overexposure, mine operators may be required to sample to ensure that controls are working.***
26. Crystalline silica is the same thing as crystalline quartz. True/***False*** ***– Crystalline quartz is only one form of crystalline silica. The three types of crystalline silica of main concern are quartz, tridymite and cristobalite. While the standard limits the average respirable crystalline silica concentration to which a worker may be exposed over an 8-hour shift to less than 0.1 mg/m^3, concentration limits for cristobalite and tridymite are ½ this level or about 0.05 mg/m^3.***

27. Silicosis is a condition where crystalline silica causes the lung tissue to react by developing fibrotic nodules and scarring around the trapped silica particles. ***True***/False – ***Chronic silicosis limits the ability of the lungs to transfer oxygen into the bloodstream through which it is delivered to other parts of the body. Acute silicosis, resulting from extremely high exposures for short periods of time, causes death by severe lung inflammation.***
28. Silicosis is a disease, the effects of which can be reversed, given time. True/***False*** ***-- Silicosis is irreversible.***
29. The correct use of dust respirators requires training. ***True***/False
30. A person experiencing any difficulty wearing a dust respirator should receive a medical evaluation to determine if the person is capable of wearing one. ***True***/False – ***A medical evaluation will determine whether or not the person is capable of wearing a respirator. Some people cannot wear a respirator and breathe sufficient air to do work.***
31. A dust respirator is not effective if the worker wearing it has beard stubble. ***True***/False **– *Beard stubble breaks the seal between the respirator and the worker's face, and the dusty air simply bypasses the respirator, offering no protection to the worker.***
32. Qualitative fit testing requires a specialist to perform. True/***False*** -- ***A kit with instructions is available for less than 100 dollars.***

RESPIRATORS



Is your respirator really protecting you from the hazards in the working environment? The best way to reasonably assure proper filtration is to make sure the respirator is properly selected, fitted, used and maintained in accordance with ANSI Z-88.2 ***(Note -- you should not need to purchase the expensive ANSI standards if you use the information provided in this Section)***, "Practices for Respiratory Protection", which is incorporated by reference in Section 72.710 of 30 CFR.

As an individual, you need to be aware of the potential of being exposed to airborne hazards and their properties. A proper size respirator and appropriate filters then need to be chosen. Respirators are not one-size fits all and one-type of filter protects against all airborne contaminants. In order to assure the respirator fits you properly either a qualitative or quantitative test needs to be conducted with the proper filters for the hazards in your occupation. The qualitative testing method is the most common at most mines, with an acceptable respiratory protection program. The miner is subjected to a test atmosphere that can detect an improper fitting respirator. Also, miners that wear respirators must maintain a face piece to face seal which means keeping the face free of facial hair at all points the respirator contacts the face.

Once the miner is fitted and the filters selected, the miner needs to know and follow the proper maintenance and care necessary to maintain the respirator. The respirator needs to be properly inspected for any defects prior to and after each use. The respirator needs to be properly cleaned and disinfected at regular intervals and stored in the proper environment. Once all of this has been accomplished the miner needs to know when to wear the respirator to reduce any potential exposure to airborne contaminants. Of course, in order for the respirator to be effective, it must be worn properly.

OPERATORS – TAKE NOTE OF THE FOLLOWING! YOU SHOULD CONCLUDE THAT YOUR LEAST COSTLY APPROACH TO DUST WILL BE TO CONTROL IT FROM DAY 1.

56/57.5005 Respiratory Protection – From MSHA's Program Policy Manual (Volume IV)

Standard 56/57.5001(a) requires that a miner's exposure shall not exceed the permissible limit of any substance on the 1973 ACGIH TLV list. When the TLV is exceeded, standard 56/57.5005 mandates that operators install all feasible engineering controls to reduce a miner's exposure to the TLV. Respiratory protection is required when controls are not feasible, as well as when establishing controls, and during occasional entry into hazardous atmospheres to perform short-term maintenance or investigations. Whenever respirators are required, operators must establish a respirator program containing all elements of the standard, which incorporates ANSI Z88.2-1969.The inspector must evaluate the effectiveness of the respiratory protection in order to determine whether miners are protected from overexposure. If the operator's respiratory protection program fails to include proper selection and fit testing, the .5001(a)/.5005 violation is significant and substantial ("S and S").

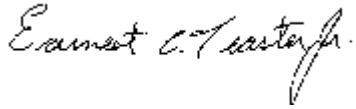
Respirator selection directly affects the efficiency of the respirator. Respirators are designed to protect wearers from inhalation of hazardous atmospheres. There are many different types of respirators but each is limited in protection and application. A respirator can only protect against atmospheres for which it is designed. Without proper selection a serious health hazard may occur. A serious hazard may also occur if the respirator, even though properly selected, is not fitted as required by the standard. Fit testing is essential in order to assign the correct model and size respirator to a miner. Otherwise, it is likely that the respirator will leak and the miner will be overexposed to the toxic substance.

There are other factors that should be considered by the inspector on a case-by-case basis when determining whether the violation should be "S and S" with regard to an operator's respiratory protection program. These factors include training, cleaning and sanitizing, and maintenance of respirators.

With regard to listed nuisance particulates and silver metal overexposures between 0.01 mg/m3 and 0.1 mg/m3, operators must use engineering controls to reduce exposure to the permissible limit and comply with the respiratory protection requirements of standard 56/57.5005. However, the .5001(a)/.5005 citation for overexposure to nuisance particulates and to silver metal in the above concentration range is not "S and S." Overexposures to soluble compounds of silver, such as silver nitrate, above 0.01 mg/m3 should be considered "S and S" if adequate protection was not worn.

EFFECTIVE DATE: 04/03/2000 EXPIRATION DATE: 03/31/2002

PROCEDURE INSTRUCTION LETTER NO. I00-IV-4



FROM: EARNEST C. TEASTER, JR.
Administrator
Metal and Nonmetal Mine Safety and Health

SUBJECT: Use of Respirators, Respirator Programs, and Engineering Controls

Scope
This letter applies to Metal and Nonmetal Mine Safety and Health (MNMS&H) enforcement personnel.

Purpose
This procedure instruction letter provides guidance on the issuance of citations for overexposure to airborne contaminants and abatement of the violations involving respiratory protection.

Procedure
When a citation is issued for a violation of 30 CFR 56/57.5001/5005 because the miner's exposure exceeds a permissible level, the initial abatement time should reflect the time needed for the mine operator or independent contractor to furnish the miner with a respirator, institute a comprehensive respiratory protection program in accordance with 56/57.5005(b), and train affected employees in respirator use, wear, and maintenance. The abatement time allowed for implementing the respiratory protection program would generally be of a shorter duration than the abatement time for the engineering controls. If the mine operator already has a comprehensive respiratory protection program in place, the initial abatement time should be based on the time needed to implement the necessary engineering controls. If these actions have not been taken by the initial abatement time, the inspector will determine if an extension of the abatement time is warranted.

The abatement time may be extended for a reasonable time period to allow work to resume with employees utilizing respiratory protection until engineering controls have been installed and tested to ensure they reduce the exposure level of the miner to values at or below the permissible limit. No health citation is to be extended beyond 12 months from the date of issue without approval from the Chief, Division of Health.

If the inspector determines that an extension of the abatement time is not warranted, the inspector must issue a Section 104(b) noncompliance order requiring that the affected miner(s) be removed from the area. Once the mine operator or independent contractor satisfies the conditions for respiratory protection, the order should be modified to allow the miner(s) to resume work in the

area until engineering controls that reduce exposures to permissible levels are established. If respiratory protection violations are repeated during the abatement period, the order that was issued should be re-modified back to the original and the miner(s) withdrawn again from the work area. Any such violations should be completely documented.

Respiratory protection citations should be terminated when:

- a written respiratory protection program in accordance with ANSI Z88.2-1969 is established as required by 56/57.5005(b);
- the proper respirator is selected and the miner is fit-tested with the selected respirator, (fit-testing is required for both disposable respirators and those using replaceable cartridges or filters);
- the proper cartridge, canister, or filter is used;
- the miner has been trained on how to wear, store, and maintain the respirator; and
- storage and cleaning facilities for the respirator have been provided.

In determining the gravity of a violation, the inspector should evaluate the actions the mine operator has taken to control employee exposure, including operator or contractor sampling, and the nature and level of the employee's exposure to the contaminants. The lack of exposure control measures and the presence of one or more health-threatening contaminants at levels near or above the permissible limits indicate a serious risk for miners. In determining the number of persons affected, the inspector should consider the probable exposure of miners on other shifts who may be performing the same tasks.

Summaries of the key elements of a respiratory protection program and inspection of half-mask respirators are attached to assist inspectors when determining whether the respiratory protection or the respiratory protection program is in compliance with 56/57.5005 and ANSI Z88.2-1969, and evaluating the gravity of the violation (Attachments 1 and 2).

Background

Both respiratory protection and engineering controls are usually cited on the same citation under standards 30 CFR 56/57.5001/.5005. This is a reissue of the procedures established to help reduce confusion regarding the issuance, abatement, and modification of these citations and orders.

Authority

Section 103(a) of the Federal Mine Safety and Health Act of 1977; 30 CFR 56/57.5001/5005.

Filing Instructions

This Procedure Instruction Letter should be filed in the binder for MSHA Program Handbooks and Procedure Instruction Letters.

Issuing Office and Contact Person

Metal and Nonmetal Mine Safety and Health, Health Division
Christopher Findlay, (703) 235-8307

Distribution
Program Policy Manual Holders within MNMS&H

Attachments
Attachment 1
Attachment 2

ATTACHMENT 1 for PIL00-IV-4
Use of Respirators, Respirator Programs, and Engineering Controls

Evaluation of Half-Mask Respirators

Applies to: non-powered, tight-fitting, negative pressure air-purifying respirators provided by mine operators to miners and respirators supplied by MNMS&H to inspectors.

Does not apply to: full-face, supplied air, or powered air-purifying respirators; self-contained breathing apparatus (SCBA); filter-type self-rescuers, or self-contained self-rescuers.

Face Piece
1. No chemical contamination or excessive dirt
2. No cracks, tears, holes, or distortion
3. No broken or cracked holders for cartridges or canisters
4. No missing seals or gaskets; seals fit properly
5. Rubber or silicone face pieces are soft, flexible, pliable

Head Straps
1. No breaks, tears, or straps missing
2. No loss of strap elasticity
3. No broken or malfunctioning strap buckles
4. Straps are securely attached to face piece

Valves
1. No dust, dirt or debris in or under seals
2. No cracked, torn, perforated, distorted, or missing valves, valve membranes, or valve covers
3. Valves are inserted and sealed properly in face piece

Air Purifying Elements (cartridges, canisters)
1. Cartridge, canister, or filter appropriate for the hazard

2. Connections are tight, seal well, and no cross threading
3. Cartridge or canister not cracked, damaged, or missing
4. Cartridge or canister does not cause excessive resistance to breathing; replaced according to manufacturer's instructions
5. Cartridge or canister shelf life not exceeded
6. Matching manufacturer cartridge or canister for model respirator

Respirator Use
1. All persons wear respirators in areas designated for respirator usage.
2. Persons in occupations required to wear respirators are wearing respirators while in their work place.
3. Respirators are inspected and fit-checked before use, and worn properly:

a. Good face seal: subject is clean-shaven everywhere respirator touches face
b. Straps: proper number of straps, worn on head and not over the hard hat, not too tight or too loose
c. Safety glasses do not interfere with respirator fit or face seal

ATTACHMENT 2 for PIL00-IV-4
Use of Respirators, Respirator Programs, and Engineering Controls

Respiratory Protection Program

Respiratory protection programs should be administered by an individual having sufficient knowledge of the subject to properly supervise the program. This individual should be identified in the program. Standard operating procedures must be written and cover:
a. respirator selection that is appropriate for hazards; and
b. respirator use.

Employee training: Training must cover all affected employees and supervisors. Training must include (at a minimum):
a. nature of the hazard and why respiratory protection is needed;
b. engineering controls; and
c. respirator selection, use, capabilities, and limitations.

Fit-testing: Must be performed for each employee using a respirator. Should include a written record of the following:
a. name of employee tested;
b. date of testing;
c. respirator manufacturer, model, style, and size worn;
d. fit-test protocol and the name of the person administering the test; and e. fit-test results.

Respirator cleaning and disinfecting: Program must include provision for:
a. cleaning and disinfecting respirators on a regular basis, or after each use if they are

used by more than one person; and
b. for disposable respirators, a provision for employees to obtain a new respirator when theirs becomes unusable, unsanitary, or exhibits excessive breathing resistance.

Respirator storage: Program must include provision for convenient, clean, and sanitary storage.

Respirator inspection: Program must make provision for respirator inspection before and after each use and during cleaning:
a. Visual inspection OK; no written record required;
b. Deficiencies identified must be corrected.

Surveillance: Work area must be periodically checked to ensure respirator use and to monitor conditions, employee exposure, and employee stress due to breathing resistance or heat.

Program evaluation: The respiratory protection program must be evaluated regularly to ensure continued effectiveness.

Generic Written Respiratory Protection Program

Mine Name:_____ Mine I.D.#_____

1. Written Procedures

a. **Hazard Identification & Respirator Selection –** Air purifying respirators are designed to protect persons from breathing specific airborne contaminants and often provide little or no protection against other contaminants. Table RPP1 lists for each hazard, the respirators this company will use, their limitations, and job duties/areas of use.

b. **Program Administrator** -- Respiratory protection programs will be administered by _____, who has sufficient knowledge of the subject to properly supervise the program.

2. Employee training

Training time, min ____ to ____
Teaching Method_____
Training Materials _____
Evaluation Method _____
Training will be done by _____
Training will cover all affected employees and supervisors. Training will be conducted before the worker begins work in the area where the respirator is needed. Training will include:

1. Engineering and administrative controls, order of priority of controls, proper use and maintenance of these controls
2. Reason respirators are required -- explanation of the hazard and its effects (i.e. acute or chronic)
3. Selection of a respirator -- fit, comfort, one you can breath through.
4. Health conditions that interfere with respirator use
5. How long can you wear a respiratory device, how to detect breakthrough, excessive resistance to flow etc.
6. Types of respirators and limitations of each including N,R, and P and 95, 99 and 100.
7. Respirators used at particular site and proper procedures for mounting, care and maintenance of each
8. Proper fit
    a. No facial hair
    b. Medical conditions affecting skin texture
    c. Self-fit test
    d. Professional fit tests
9. Inspection, cleaning/disinfecting and storage – including reusables and throw-aways.

Table RPP-1. Respirators Used on Mine Site				
Hazard	Respirator Manufacturer	Model No.	Respirator Limitations	Job Duties/Location Where Protection Will Be Used

3. Fit-testing

1. All persons required to use a respirator will be fit tested first

2. Annual fit testing to be conducted on (date)_____ by (person/organizatiion conducting test)_____

3. The test will be conducted by subjecting each person, while wearing the appropriate respirator, to the following fit test procedure:

   ___Qualitative Fit Test by one of the following methods:

   a. Stannic Chloride Smoke____

   b. Bitrex ____

   c. Saccharin____

   ____Quantitative Fit Test - the fit is acceptable if the person, while wearing a fitted respirator which has been outfitted with a sample port, is subjected to a test atmosphere (usually mineral oil mist) and the concentration of test atmosphere inside the respirator is negligible.

4. The person will perform exercises while wearing the respirator in the test atmosphere to determine if the respirator fits. Exercises will simulate at least the work of lifting, bending over, talking, movement of the head in all directions and exhibiting various facial expressions.

5. A written record form of the following will be maintained for these employees. (See copy of record form at end of this RPP):

   a. Name of employee tested;
   b. Date of testing;
   c. Respirator manufacturer, model, style, and size worn;
   d. Fit-test protocol and the name of the person administering the test;
   e. Fit-test results.

6. If during respiratory fit testing, the employee experiences difficulty breathing through the respirator(s), the employee will be evaluated by a physician to determine his/her medical suitability for wearing a respirator.

4. Respirator cleaning and disinfecting

Users will be trained:

1. To inspect respirators prior to each use to determine that they are functioning properly

2. To clean and disinfect or replace the respirator on a regular basis according to manufacturer's recommendations, or after each use if they are used by more than one person. Adequate cleaning and disinfecting facilities will be provided at the following convenient location_____

3. To store respirators in the following convenient, clean and sanitary location _____

4. For reusable respirators (person) _____ will be trained to be knowledgeable in the respirator manufacturer recommendations for the use, care and maintenance of each model of respirator provided by the Company

5. Employees will be instructed as to where and how to obtain new disposable respirators or respirator cartridges when theirs become unusable, unsanitary, or exhibit excessive breathing resistance or breakthrough. These respirators will be available at the following locations: _____.

   _____

5. Records of actions taken

(See fit testing/training record form at end of this RPP)

1. Records of fit-test which identify:

   a. The exact model and size respirator

   b. Date of testing

   c. The fit-test method and

   d. Whether the person passed or failed the test.

2. Records of training provided which include at least:

   a. Identification of persons

   b. Date of training and

   c. Topics covered.

6. A statement of use

1. Assigned respirators will be worn by persons at all times while in the normal work areas where persons may be overexposed; These areas will be posted “Respirator Required” and

2. Work area(s) affected will be periodically checked to ensure that employees are using respirators and to check dust controls, employee exposure, and employee stress due to breathing resistance or heat. The area supervisor will include this check on his/her daily walk-around inspection.

Procedures to be used for Qualitative Dust Respirator Fit Testing

Training

1. Controls and their order of priority -- examples of engineering and administrative controls

2. Reasons respirators are required for the persons being trained
   a. Protect health from what?
   b Remove what from breathing zone?
   c. Acute or chronic effect?
   d. PPE is considered by MSHA to be for temporary use until feasible controls are installed.

3. Selection
   a. Use only the correct respirator for the contaminant of concern.
   b. Make sure the respirator you select is comfortable -- If not, let your supervisor know – you may need to select a different type
   c. Make sure you don't need to strain to breathe with the respirator on
      (1) If you do, ask your supervisor to schedule a medical examination
      (2) If medical examination shows you can't wear a respirator, you may need to transfer to a different job

4. Health conditions that interfere with respirator use.
   a. Heart condition
   b. Asthma or other breathing condition
   c. Claustrophobia
   d. Contact lenses
   e. Eye glass temples
   f. Missing teeth
   g. Skullcaps
   h. Other

5. How long can you wear a respirator
   a. Contaminant break through
   b. High breathing resistance

6. Types of respirators
   a. Filtering (air purifying) and air supply
   b. Types of filtering respirators
   c. Types of particulate respirators and classes
      (1) N, R, and P and 95, 99, and 100.
      (2) Other toxins

(3) Problems caused when the wrong type is used

7. Types used at this site and proper procedures for putting them on -- Read instructions for and demonstrate each type used

8. Proper fit
   a. How to get a good fit?
      (1) Remove all facial hair; cooperate fully during fit testing.
      (2) How to self fit-test the respirator each time it is put on
         (a) Breathe out with exhaust valve sealed by hand – should feel respirator lift from face
         (b) Breathe in with inhalation valve sealed – respirator should cling with no leaks

9. How to inspect respirator and how to clean reusable type, how to store respirator.

SACCHARIN/BITREX FIT TESTS -- Follow the manufacturer's instructions

(Protocol below contains detailed procedure used by MTU in past testing)

Items Needed for Test

1. Selection of respirators to be available at site (the selection should include enough of each type so that each person tested can try one of each and obtain one).
2. Filter cartridges to use when fitting non-dust respirators.
3. Saccharin (or Bitrex) fit test kit including:
   a. Dilute test solution (to test the person's sensitivity) and concentrated test solution (for fit testing)
   b. Test Hood and collar
   c. Dispensers (nebulizers) for dilute and concentrated solutions and spare parts
   d. Forms to be used as records that people have been fit tested (copy form at end of this section)
      (1) Date
      (2) Fit person's name
      (3) Type of respirator person is qualified to use (model and serial no)
      (4) Type of test used
      (5) Statement **"By my signature, I verify that I did not detect [***the sweet taste of saccharin***] [***the bitter taste of Bitrex***] during any of the actions required in fit testing me. However, I did taste the test substance during the sensitivity test"**
      (6) Fit person's signature
      (7) Tester's name
      (8) Tester's signature

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SACCHARIN/BITREX FIT TESTS (continued)

Room Set up for Qualitative Fit Testing

1. Set up Work Table for materials in fit test area, and a work table in another room or at least 20 feet away for the sensitivity test
2. Set up hood assemblies
3. Pour about one teaspoonful of weak solution (#1) into nebulizer labeled #1
4. Pour about one teaspoonful of strong solution (#2) into nebulizer labeled #2
5. Set up all the different types of respirators that Company wants to fit test and supply each with a dust filter for fit testing using saccharin or Bitrex
6. Mirror(s) for fitting respirator.

Conducting Test

1. Bring in subjects ahead of time, show them how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to determine an acceptable fit
2. Tell them how to select a respirator – hold each chosen facepiece up to the face and eliminate those that obviously do not give an acceptable fit
3. Review the following comfort and fit criteria with each person:
   a. Position of mask on the nose
   b. Room for eye protection
   c. Room to talk.
   d. Position of mask on face and cheeks
   e. Chin properly placed
   f. Adequate strap tension, but not too much.
   g. Fit across nose bridge
   h. Respirator of proper size for distance from nose to chin
   i. Tendency of respirator to slip
   j. Self-observation in mirror
4. Instruct subject on how to conduct self-fit test and have him/her conduct one; also that if it works proceed with the fit test, otherwise the subject may need to select another respirator
5. Allow subjects to select respirators from a sufficient number of models and sizes and to self-fit test those selected
6. Read the material on the following page.

SACCHARIN/BITREX FIT TESTS (continued)

Preliminary remarks for test

Saccharin only -- If you've used sweetener in the past hour, postpone taking this test until later. This includes chewing gum, candy, drinking pop, drinking coffee with sweetener etc.

Bitrex & Saccharin -- Please tell me if you suspect you're unable to taste a weak solution. If you're unable, the test we're using won't work and we'll need to use another test.

Correct respirator fit is serious business. Wearing an improperly-fitting respirator is false security, which makes you think you can go into dusty or other areas without serious consequences.

Dust respirators are for dust only. A dust respirator will not filter out toxic gases. Make sure you're using the correct respirator.

Persons with facial hair can't be fit with a respirator, and can't legally work in areas where a respirator is required. A caring supervisor is obliged to send you home if you're not clean shaven and need to work in an area requiring a respirator. Repeat court cases have upheld management's rights to require persons working in respirator-use areas to be clean-shaven or sent home.

How we plan to fit test you

1. You'll first select a comfortably-fitting respirator by holding it up against your face as it would be when in actual use. This is the respirator you're legally authorized to use from now on if the remaining steps in the selection procedure are successful.

SACCHARIN/BITREX FIT TESTS (continued)

2. You'll put the respirator on and properly adjust the straps. Note that if you must wear safety glasses or other head-mounted safety equipment in your work area, you must wear this equipment during these tests.

3. You'll wear the respirator for at least 5 minutes to determine if it's comfortable. You'll need to talk, walk, turn your head from side to side and up and down and make other movements that are similar to movements you make during your work in the respirator area of your workplace.

4. You're then ready to be fit tested.

5. You'll put the hood over your head and I'll blow the test mist into one of the openings in the front of the hood. I'll blow in more test mist every 30 seconds while you're performing the following movements for 60 seconds each. During the entire test, you'll breath through your mouth so you are able to taste any test solution that gets past the respirator.

    a. Normal breathing
    b. Deep breathing (if you feel faint, ease up).
    c. Turning head from side to side and inhaling in each position.
    d. Nodding head up and down and inhaling in the up position.
    e. Counting or reading the rainbow passage.
    f. Grimacing while breathing.

6. If during any of the above exercises you taste the test mist, the respirator doesn't fit and will not provide complete protection. You'll need to select another respirator and start over.

SACCHARIN/BITREX FIT TESTS (continued)

7. Finally, after you've removed the hood, you'll go to the other end of the room and while you're breathing through your mouth, I'll blow a very weak solution of test mist toward your mouth using 10 squeezes of dispenser bulb. If you taste the test mist now, but did not taste it with the respirator on, you're properly fit.

For your health's sake, please be honest – if you taste the test mist at any time while wearing the respirator, stop me immediately and select a different respirator to start the test over with.

STANNIC CHLORIDE SMOKE FIT TESTS -- Follow the manufacturer's instructions (Protocol below contains detailed procedure used by MTU in past testing)

Items Needed for Test

1. Selection of respirators to be available at site
2. Filter cartridges to use when fitting non-dust respirators
3. Fit test kit including:
   a. Stannic Chloride Smoke Tubes, Squeeze Bulb and Tubing
   b. Forms to be used as records that people have been fit tested (copy form at the end of this writeup)
      (1) Date
      (2) Fit person's name
      (3) Type of respirator person is qualified to use (model and serial no)
      (4) Type of test used
      (5) Tester's name
      (6) Tester's signature

Room Set up for Qualitative Fit Testing

1. Set up Work Table for materials in fit test area, and a work table in another room or at least 20 feet away for the sensitivity test
2. Adequate ventilation to remove smoke
3. A suitable number of repirators of each type so that each person to be tested can try out each type and select one that is suitable. For disposable respirators, provide a suitable number dust filtering cartridges for the test. These must be either HEPA or P100 filters when using stannic chloride for the test
4. Mirror(s) for fitting respirator.

STANNIC CHLORIDE SMOKE FIT TEST (continued)

Conducting Test

Note – The technician must always cover the free end of the smoke tube with tubing to minimize the likelihood of injury.

1. Bring in subjects ahead of time, show them how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to determine an acceptable fit.
2. Tell them how to select a respirator – hold each chosen facepiece up to the face and eliminate those that obviously do not give an acceptable fit.
3. Review the following comfort and fit criteria with each person:
   a. Position of mask on the nose
   b. Room for eye protection
   c. Room to talk
   d. Position of mask on face and cheeks
   e. Chin properly placed
   f. Adequate strap tension, but not too much
   g. Fit across nose bridge
   h. Respirator of proper size for distance from nose to chin
   i. Tendency for respirator to slip
   j. Self-observation in mirror
4. Instruct subject on how to conduct self-fit test and have him/her conduct one; also that if it works proceed with the fit test, otherwise the subject may need to select another respirator
5 Allow subjects to select respirators from a sufficient number of models and sizes and to self-fit test those selected
6. Conduct sensitivity test as follows (see instructions next page):
   a. Advise test subjects that the smoke irritates the eyses, lungs, and nasal passages and keep the eyes shut
   b. Carefully direct a small amount of the smoke in the test subject's direction to determine that he/she can detect it
   c. After detecting the irritant smoke, the subject puts the respirator on and performs the required self-fit check(s)
7. Conduct these tests as on the following pages. The person must still be sensitive after the fit test or the test results are invalid. Complete the test record for each person that is successfully fitted
8. Read the material on the following page

STANNIC CHLORIDE SMOKE FIT TEST (continued)

Preliminary Remarks

Correct respirator fit is serious business. Wearing an improperly fitting respirator is false security, which makes you think you can go into dusty or other areas without serious consequences.

Dust respirators are for dust only. Each respirator has a **specific** purpose. A dust respirator will not filter out toxic gases. Make sure you're using the correct respirator.

Persons with facial hair can't be fit with a respirator, and can't legally work in areas where a respirator is required. A caring supervisor will feel obliged to send you home if you're not clean shaven and need to use a respirator. Repeat court cases have upheld management's rights to require persons working in respirator-use areas to be clean-shaven or sent home.

HOW WE PLAN TO FIT TEST YOU

1. Before you select and put on a respirator, we will need to expose you to a small amount of the irritant smoke to see if you are sensitive to it.

2. You will then select the respirator that seems to fit you best following the procedures below.

3. We will then subject you to irritant smoke with the respirator on and while you are performing certain exercises.

4. Finally we will repeat the exposure to a small amount of irritant smoke with the respirator off.

STANNIC CHLORIDE SMOKE FIT TEST (continued)

Close your eyes now and I'll blow some in your direction. Let me know what effect it has on you.

1. Now that we've determined that you are sensitive to the irritant smoke, you will select a comfortably-fitting respirator by holding it up against your face as it would be when in actual use. **This is the respirator you'll be legally authorized to use from now on if the remaining steps in the selection procedure are successful.**

2. You'll put the respirator on and properly adjust the straps. Note that if you must wear safety glasses or other head-mounted safety equipment in your work area, you must wear this equipment during these tests.

3. You'll wear the respirator for at least 5 minutes to determine if it's comfortable. You'll need to talk, walk, turn your head from side to side and up and down and make other movements that are similar to movements you make during your work in the respirator area of your workplace.

4. You'll do a self-fit test before the stannic chloride fit test. This involves (manufacturer's recommendations for self-fit testing) _____
   _____

5. If the respirator seems to be OK and to fit your face with no leaks, you are ready to be fit tested with the stannic chloride smoke. Remember -- **Breathing stannic chloride smoke is very uncomfortable and will cause you to cough! Also keep your eyes closed during the test – it burns your eyes!**

STANNIC CHLORIDE SMOKE FIT TEST (continued)

6. I'll blow stannic chloride smoke around the edges of your respirator from about 12 inches distance. If you don't cough,

STANNIC CHLORIDE SMOKE FIT TEST (continued)

I'll blow more smoke around your respirator from 9 and then from 6 inches while you're performing the following movements for 60 seconds each.

a. Normal breathing
b. Deep breathing (if you feel faint, ease up).
c. Turning your head from side to side and inhaling in each position.
d. Nodding your head up and down and inhaling in the up position.
e. Counting or reading the rainbow passage.
f. Grimacing while breathing.

7. If during any of the above exercises the stannic chloride makes you cough, the respirator doesn't fit and will not protect you. You'll need to select another respirator and start over.

Since you didn't cough when subjected to irritant smoke with the respirator on we'll need to check your sensitivity to irritant smoke once more. Close your eyes now and I'll blow some in your direction again. Let me know what effect it has on you.

The test indicates that you are still sensitive to the irritant smoke, but were unaffected with the respirator on. These results indicate that the respirator fits. Remember, this is the only respirator you are legally approved to wear. Before you can legally use a different respirator, another fit test will need to be conducted.

Respirator Fit Testing Record

This is to certify that _____, social security number _____ has been trained and fitted in the use, limitations, and maintenance of the following respirator:

Manufacturer_____
Model number_____
Protection against _____

using the following protocol.

Bitrex Solution Aerosol ____
Saccharin Solution Aerosol ____
Stannic Chloride Smoke ____

The following test exercises were performed while being tested for at least 60 seconds each.

1. Normal breathing
2. Breathing deeply
3. Turning head from side to side, inhaling in each position
4. Nodding head up and down, inhaling in the up position
5. Counting or reading the rainbow passage

" I acknowledge that I have received respirator training and have been fit test according to the above instructions. By my signature, I verify:

____Saccharin or Bitrex Protocol -- That I did not detect the test solution during any of the actions required in fit testing me with the respirator on which this test qualifies me for. I did, however, taste the test solution during the sensitivity test".

____Stannic Chloride Protocol – That I did not smell the stannic chloride smoke with the respirator on and (or) did not need to cough because of it". I did smell the smoke when tested for sensitivity with the respirator off.

_____

Signature of Person Fit Tested Date

_____

Signature of Test

Section 7
Training Plans and Procedures
Action Items

1. Determine if your mine falls under CFR 30 Part 46 or Part 48 for safety training purposes. Contact Dave Carlson (phone 906-487-2453 or email dcarlson@mtu.edu) – also ask for a written Part 46 Training Plan.
2. If you fall under Part 46, you need a training plan. Under Part 48, you may train under the certified trainer's plan. The following types of training are required under both parts:
   a. Train all new inexperienced miners for 24 hours (40 hours for underground).
   b. Train all newly hired experienced miners for at least the minimum times listed on the Part 46 training plan. Part 48 requires a full 8 hours for some surface miners.
   c. Task-train all workers in any newly-assigned tasks. Update training if task procedures change.
   d. Annual refresher training is 8 hours for Part 46 and Part 48 and must be done by the end of the 12th month after the miner is hired, and every year thereafter by the end of the same month as during the previous year.
   e. Give site-specific hazard training to all visitors (customers, etc.) This can be done by judicious use of warning signs or with verbal/written instructions, whichever you have specified in your training plan. For miners who go to different mine IDs, site-specific hazard training is required at each ID along with a training certificate (certificate not required for non-miners).
3. Keep records of annual refresher training for 2 years and of all new miner and task training until 60 days after the miner terminates employment. Issue training certificates. Follow instructions given here for completing certificates correctly.
4. Part 46 training must be done by the competent person(s) or training organization(s) listed in your mine's training plan. Training certificates must be signed by the mine employee responsible for safety and health listed in the mine's training plan. Training certificates must meet the requirements of the standard. If form 5000-23 is used, complete it according to the instructions in this section.
5. For Part 48 training, the certified trainer can sign the 5000-23 training certificate, but MSHA recommends that it be done by the mine person responsible for safety and health at the mine (remember, however, that Part 48 new miner, new experienced miner, and annual refresher training (but not task training) must be done by an MSHA-certified trainer). Follow the instructions in this section for completing form 5000-23.

SECTION 7

Training Test

1. Part 48 is the part of 30CFR dealing with metal, coal, gypsum and underground mining operations. T___, F___

2. Part 46 deals with almost all surface nonmetal, nongypsum, noncoal mines as well as cement plants. T___, F___.

3. A part 48 training plan requires MSHA approval, but a part 46 plan is considered to be approved if it meets the standards requirements. T___, F___

4. Part 48 training, other than task and site-specific hazard training, must be done by MSHA-certified instructors. T___, F___

5. Part 46 training must be done by MSHA-certified instructors. T___, F___

6. A competent person who trains miners must be approved by MSHA. T___, F___ ***Part 46 training for each subject covered must be done by the competent company person(s) and/or training organizations listed for that subject in the company's training plan.***

7. Part 46 task training must be done by a competent person. T___, F___. ***The training organizations name, or a miner who is competent to train the subject matter must be listed in the mines plan.***

8. A Part 46 training certificate must be signed by the person responsible for safety and health at the mine, while a part 48 certificate may be signed either by the MHSA-certified instructor or by the person at the mine responsible for safety and health. T___, F___

9. 4 hours of part 46 new inexperienced miner training must be completed before the miner goes to work and the remaining 20 hours may include a brief review of first aid, respirator training where applicable, and practice under the supervision of the competent person listed in the mine's training plan. T___, F___

10. A Part 46 training plan must include the name of the competent person who will oversee "supervised practice of the assigned task". T___, F___

11. Part 46 requires new experienced miners to have 4 hours of training before working. T___, F___. ***Times must equal or exceed the minimum times listed in the mine's training plan.***

12. Annual refresher training is required a)___ within 1 year of completing new miner or new experienced miner training, b)___ during the following year by the end of the same month the miner was hired or had his annual refresher training, or c)___ as soon as the rest of the miners get annual refresher training.

13. Under Part 46 new inexperienced miner training, a short review of first aid must be taught within 60 days of starting work. T___, F___.

14. Under Part 46, a new inexperienced miner must have a full first aid and CPR course before he can work. T___, F___. ***Advanced first aid, as required by 56.18010, must be offered to all interested***

miners and at least one trained person must be available at the worksite whenever work is taking place.

15. An on-road truck driver who loads his own truck with sand and gravel is considered a miner under Part 46 and needs comprehensive training. T___, F___.

16. An on-road truck driver who only goes on mine property to have the mine operator load his truck with sand and gravel is considered a miner under Part 46 and needs comprehensive training. T___, F___.

17. Part 46 specifies the entire list of subjects required for annual refresher training. T___, F___ ***Eight hours of annual training is required; one topic – changes adversely affecting safety and health – is required. Other subjects are to be selected by the mine operator and listed in the mine's training plan along with competent person(s) and/or training organizations for each.***

18. A truck driver who hauls sand and gravel from one location on mine property to another location on mine property needs comprehensive training under Part 46. T___, F___

19. Before Part 46 training can commence, the training plan used must be posted for 2 weeks at a location where the miners can review its contents. T___, F___

20. To become an experienced miner under Parts 46 and 48, the person must have received new miner training T___, F___, have 12 months of cumulative experience T___, F___, and have gained his/her 12 months experience within 3 years. T___, F___ (***see the standard for exceptions for miners who were experienced miners before Oct. 2, 2000 for Part 46 and February 3, 1999 for Part 48***).

21. People who maintain and/or repair mining equipment at mine sites for "frequent" or "extended" periods do not need annual refresher training if the equipment is shut down and away from mining activities. T___, F___

22. A miner transferred to another Part 46 mine owned by the same employer only needs site-specific hazard awareness training. T___, F___

23. A contractor who has the mine operator perform the contractor's Part 46 training need not have a training plan T___, F___

24. A Part 46 training plan can cover only one mine. T___, F___

25. A Part 46 training certificate can list the names of more than one trainee. T___, F___

26. Annual refresher training can address both Part 46 and Part 48. T___, F___

27. Training records should be available where they can be sent to the mine site immediately at the request of the MSHA inspector. T___, F___

28. Construction workers not exposed to mine hazards need only receive site-specific hazard awareness training. T___, F____

29. Independent contractors, who are miners under Part 46, must make available at the mine site, a copy of each miner's training certificates for inspection. T___, F___.

30. Miners are required to carry Part 46 training certificates. T___, F___

Introduction to Part 46

Note: *A miner is any person, including operators or supervisors, who works at a mine and who is engaged in mining operations. This definition includes independent contractors and employees of independent contractors who are engaged in mining operations and any construction worker who is exposed to hazards of mining operations.*

Part 46 Applies to -- Miners Engaged in Shell Dredging or Employed at Sand and Gravel, Surface Stone, Surface Clay, Colloidal Phosphate, Surface Limestone, Marble, Shale, Kaolin, Feldspar, Granite, Traprock, Cement, Lime, Sandstone, and Slate Mines and Operations

What Part 46 Means to You? – MSHA can issue citations and withdrawal orders to sand and gravel, surface stone, surface limestone, surface clay, shell dredging, and colloidal phosphate mines for failure to provide training that meets the requirements spelled out in 30 CFR Part 46.

-- Mine operators and contractors must have a training plan (need one? – contact Dave Carlson – 906-487-2453 or see http://www.msha.gov/TRAINING/STATES/STATES.HTM for the contact in your state).

-- New miners must receive at least 24 hours of training, with a minimum of four hours of instruction in eight specific areas before they start work. The eight areas are: 1)introduction to the work environment, 2)instruction in recognizing and avoiding hazards, 3)review of escape and emergency plans, 4)instruction on health and safety aspects of the work they will be doing, 5)instruction on statutory rights of miners, 6)a review and description of the line of authority, 7)an introduction to the procedures for reporting mine hazards and 8) information about the physical and health hazards of chemicals in the miner's work area, the protective measures a miner can take against these hazards, and the contents of the mine's HazCom program..

-- Miners must receive at least eight hours of annual refresher training yearly by the end of the same month as during the previous year, which covers major changes at the mine which may adversely affect safety and health and other topics specified in the mine's training plan.

-- Miners must also be trained on health and safety aspects of each newly assigned task including hazardous chemicals they may be exposed to.

-- Training must be provided by a competent person (a person designated by the production-operator or independent contractor who has the ability, training, knowledge, or experience to provide training to miners in his or her area of expertise. The competent person must be able both to effectively communicate the training subject to miners and to evaluate whether the training given to miners is effective). Instructors do not need MSHA approval, but must be listed in the training plan by subject.

-- Mine operators are allowed to substitute equivalent training required by OSHA or other federal or state agencies, if this training is listed in the mine's training plan along with the competent persons/ organizations, times, materials, training methods and evaluation methods. Certificates for this training must also meet MSHA's requirements.

You need to have a training plan on file for each of five types of training:

- New miner
- Newly-hired experienced miner
- New task

- Annual refresher
- Site-specific hazard awareness

Training Plan Requirements

A training plan [Section 46.3(b)] is automatically approved without submitting it to MSHA if it contains the following information"

- Mine Name(s);
- MSHA mine ID number(s) or independent contractor (if available) identification number(s);
- Name and position of designated person responsible for health and safety training at the mine;
- General description of teaching methods – i.e. lecture, discussion, etc.
- Course materials to be used in training program, including subject areas to be covered, i.e. MSHA, Company, Vendor, etc.
- Approximate time to be spent on each subject area – i.e. ½ to 3 hours;
- List of persons and/or organizations who will provide the training, and the subject areas in which each person and/or organization is competent to instruct;
- The evaluation procedures used to determine the effectiveness of training.

SUMMARY OF PART 46 FOR NEW MINES

Part 46 Training Requirements for Newly Opened Mines

- **Develop a training plan.** The plan must include all of the information called for in 30 CFR 46.3. If Starter Kits are used, new miner, newly employed experienced miner, and task training programs need to be changed to include "information about the physical and health hazards of chemicals in the miner's work area, the protective measures a miner can take against these hazards, and the contents of the mine's HazCom program" (46.5{b}{4}, 46.6{b}{4}, 46.7{a}).

- **Provide miners with new miner training or newly employed experienced miner training, as appropriate.** Experienced miner training is appropriate for the following: (1) miners who had at least 12 months of cumulative surface mining or equivalent experience on or before October 2, 2000; (2) miners hired on or after October 2, 2000 who have completed 24 hours of new miner training under 46.5 or 48.25 and who have at least 12 cumulative months of surface mining or equivalent experience; or (3) miners with less than 12 cumulative months of surface mining or equivalent experience who have completed new miner training under 46.5 or 48.25 within 36 months before beginning work at the mine. Experienced miner training must be provided before any of the above-described miners begins work at the mine. New miner training must be completed no later than 90 days after a person who is not an experienced miner begins work at the mine according to the provisions of 46.5. Miners who have not yet received the full 24 hours of new miner training must work where an experienced miner can observe that the new miner is performing his or her work in a safe and healthful manner.

- **Provide task training to miners who are reassigned to new tasks in which they have no previous work experience.** Task training must also be provided if changes in assigned tasks occur that affect health and safety risks. Miners with previous training and experience in assigned tasks may be excused from training if they demonstrate the necessary skills to safely perform the tasks. Practice under the close observation of a competent person may be used to fulfill the task-training

requirement if hazard recognition training specific to the assigned task is given before the miner performs the task.

- **Provide each miner with no less than eight hours of annual refresher training no later than the end of the 12th month after the miner begins work at the mine.** If the new miner was hired April 2, 2003, the next round of annual refresher training must be completed by April 30, 2004 and the following round no later than April 30, 2005 etc.

Provide site-specific hazard awareness training to office personnel, scientific workers, delivery workers, customers, vendors, visitors, and independent contractors.

Training Requirements – Surface Mines – Parts 46 and 48*

This is an attempt to summarize the standards – See 30 CFR for more accurate information!

	Part 46	Part 48 (Surface Mines)
Commodity Mined		
	Miners Engaged in Shell Dredging or Employed at Sand and Gravel, Surface Stone, Surface Clay, Colloidal Phosphate, Surface Limestone, Marble, Shale, Kaolin, Feldspar, Granite, Traprock, Cement, Lime, Sandstone, and Slate Mines and Operations	Miners employed at coal, metal, gypsum, and underground mines.
Who needs comprehensive training?		
	Any person, including any operator or supervisor, who works at a mine and is engaged in mining operations -- includes contractors engaged in mining operations; and maintenance or service workers who work at a mine site for frequent or extended periods -- also construction workers exposed to hazards of mining operations.	Person including operator working in a surface mine or surface areas of an underground mine who is engaged in the extraction and production process, or who is regularly exposed to mine hazards, or who is a maintenance or service worker employed or contracted by the operator to work at the mine for frequent or extended periods. Short-term, specialized contract workers, such as drillers and blasters, who are engaged in the extraction and production process and who have received experienced-miner training, may in lieu of subsequent training under that section for each new employment, receive training under §48.31 (Hazard training). This definition does not include: (i) Construction workers and shaft and slope workers under subpart C of this Part 48
Who needs hazard training?		
	Scientific workers; delivery workers; customers (including commercial over-the-road truck drivers); vendors; or visitors, maintenance or service workers who do not work at a mine site for frequent or extended periods; also hazard training and certificates are needed by miners and contractors for each mine ID they work at.	Person working in a surface mine, including any delivery, office, or scientific worker or occasional, short-term maintenance or service worker contracted by the operator, and any student engaged in academic projects involving his or her extended presence at the mine.

Training Requirements – Surface Mines – Parts 46 and 48*		
	Part 46	**Part 48 (Surface Mines)**
Experienced Miner		
	(i) Person employed as a miner on April 14, 1999; person with 12 months cumulative surface mining or equivalent experience on October 2, 2000;(iii) person who began employment after April 14, 1999, but before October 2, 2000, who received new miner training or (iv) person employed as a miner on or after October 2, 2000, who has completed 24 hours of new miner training and who has at least 12 months of surface mining or equivalent experience.	(1) A miner who has completed MSHA-approved new miner training for surface miners or training acceptable to MSHA from a State agency and who has had at least 12 months of surface mining experience; or (2) A supervisor who is certified under an MSHA-approved State certification program and who is employed as a surface supervisor on October 6, 1998; or (3) An experienced surface miner on February 3, 1999.
Training Plan Required		
	Yes -- your own plan only	Yes -- your own or certified trainer's plan
MSHA Approval Required		
	No	Yes
On-line filing available		
	http://www.msha.gov/forms/pt48train.htm	http://www.msha.gov/forms/pt48train.htm
Plan requires		
	1) The name of the production-operator or independent contractor, mine name(s), and MSHA mine identification number(s) or independent contractor identification number(s);	1. Company name, mine name, and MSHA ID
	(2) The name and position of the person designated by you who is responsible for the health and safety training at the mine. This person may be the production-operator or independent contractor;	2. Name and position of person responsible for health & safety training
	(3) A general description of the teaching methods and the course materials that are to be used in the training program, including the subject areas to be covered and the approximate time or range of time to be spent on each subject area.	3. List of MSHA-approved instructors and courses for which qualified
	(4) A list of the persons and/or organizations who will provide the training, and the subject areas in which each person and/or organization is competent to instruct; and	4. Location where training will be given

Training Requirements – Surface Mines – Parts 46 and 48*		
	Part 46	**Part 48 (Surface Mines)**
	(5) The evaluation procedures used to determine the effectiveness of training.	5. Description of teaching methods and course materials
		6. Approximate number of miners employed and maximum number attending each session of training
		7. Schedule of annual training
		8. List of work tasks and method by which task training will be accomplished
Training records		
	Maintain until 60 days after the miner terminates employment, except annual refresher, which must only be maintained for 2 years.	**Maintain until 60 days after the miner terminates employment, except annual refresher, which must only be maintained for 2 years.**
	Modified form 5000-23 or a form containing the following: (1) The printed full name of the person trained; (2) Type, duration, date of training, name of competent person who provided the training:(3) Name of mine or independent contractor, MSHA mine identification number or independent contractor identification number, and location of training (if an institution, the name and address of the institution), (4) The statement, "False certification is punishable under § 110(a) and (f) of the Federal Mine Safety and Health Act," printed in bold letters and in a conspicuous manner; and (5) A statement signed by the person designated in the MSHA-approved training plan for the mine as responsible for health and safety training, that states "I certify that the above training has been completed."	Form 5000-23 or MSHA-Approved Alternate
Instructors		
	Competent Person designated by the production-operator or independent contractor	Except as provided in §48.27 (New task training of miners) and §48.31 (Hazard training) of this subpart B, all courses shall be conducted by MSHA approved instructors.

Training Requirements – Surface Mines – Parts 46 and 48*		
	Part 46	**Part 48 (Surface Mines)**
Instructor Requirements		
	Competent person must have the ability, training, knowledge, or experience to provide training to miners in his or her area of expertise. Person must be able to effectively communicate training subject to miners and to evaluate whether the training given is effective.	Except for task and hazard training: (1) Instructors shall take an instructor's training course conducted by the District Manager or given by persons designated by the District Manager to give such instruction; and instructors shall have satisfactorily completed a program of instruction approved by the Office of Educational Policy and Development, MSHA, in the subject matter to be taught. (2) Instructors may be designated by MSHA as approved instructors to teach specific courses based on written evidence of the instructors' qualifications and teaching experience. (3) At the discretion of the District Manager, instructors may be designated by MSHA as approved instructors to teach specific courses based on the performance of the instructors while teaching classes monitored by MSHA. Operators shall indicate in the training plans submitted for approval whether they want to have instructors approved based on monitored performance.
		Under Sections 48.3(g)/48.23(g), task training required by Sections 48.7/48.27 may be given by a qualified trainer, by an experienced supervisor, or by persons experienced in the particular task. Sections 48.3(c)(8)(ii)/48.23(c)(8)(ii) require listing
Hours of Training		
New Inexperienced Miner – Surface		
	24 – 4 hours covering required subjects before starting work, respirator training (when applicable) and First Aid review (1/2 hr +/-) within 60 days.	24 – 8 hours covering required subjects before starting work if approved by District.

Training Requirements – Surface Mines – Parts 46 and 48*		
	Part 46	**Part 48 (Surface Mines)**
New Inexperienced Miner Underground		
	N/A	40 (8 hours at mine site)
New Experienced Miner – Surface		
	Sum of minimum times for subjects listed in training plan. Not required when experienced miner returns to the same mine, following an absence of 12 months or less. Instead you must provide training on changes that could adversely affect the miner's health or safety before the miner begins work. If the miner missed any part of annual refresher training, you must provide the missed training no later than 90 calendar days after the miner begins work at the mine. Respirator training (when applicable) within 60 days.	Each experienced miner returning to mining following an absence of 5 years or more, must receive at least 8 hours of training.
Annual Refresher		
	8 hrs – by the end of the same month the year after the miner is hired or by the end of the same month the previous year's annual refresher training was completed.	8 hrs – by the end of the same month the year after the miner is hired or by the end of the same month the previous year's annual refresher training was completed.
Task		
	As in plan	As in plan
Person available who is trained in First Aid?		
	Yes - see 56.18010	Yes - see 56.18010

PARTS 46 AND 48 SURFACE MINE TRAINING – REQUIRED SUBJECTS

(Best Effort Summary Only – Accurate Information is Available in 30 CFR Parts 46 and 48)

		24 HOUR NEW MINER TRAINING		NEWLY EMPLOYED EXPERIENCED MINER TRAINING		TASK TRAINING (NEW or CHANGES)****		8 HOUR ANN. REFRESHER TRAINING		HAZARD TRAINING	
	TRAINING AREAS	PART 48	PART 46	PART 48	PART 46	PART 48	PART 46	PART 48	PART 46	PART 48	PART 46
1	Introduction to the Work Environment	x	x	x	x						
2	Hazard Recognition and Avoidance	x	x	x	x		x**			x	x
3	Emergency Medical Procedures	x	x	x	x						
4	Health and Safety Aspects of the Task	x	x	x	x	x	x				
	or task-specific hazard recognition training + practice under close supervision of competent person.		x		x						
5	Statutory Rights of Miners	x	x		x						
6	Auth. and Resp. of Supervisors/Miner's Reps.	x	x	x	x						
7	Introduction to Rules for Reporting Hazards		x		x						
8	Self-Rescue and Respiratory Devices	x	x	x	x			x	rec.	x	
9	First Aid Review	x	x					x	rec.		
10	Changes that could adversely affect health & safety			x	x*				x		
11	Safety Rules and Safe Working Procedures		x		x		x			x	
12	Supervised Practice (non-production)					x[1]	x***				
13	Other relevant health and safety subjects -- see recommended (rec.) ones								x		
14	Mandatory Health and Safety Standards	x	x	x	x			x	rec.	x	
15	Transportation Systems and Controls	x						x	rec.		
16	Communication Systems	x		x					rec.		
17	Escape and Emergency Evacuation Plans	x		x				x	rec.	x	x
18	Firewarning and Firefighting	x	x	x	x			x	rec.		
19	Ground Conditions and Control								rec.		
20	Traffic Patterns and Control		x		x				rec.		x
21	Working in Areas of highwalls								rec.		
22	Water Hazards, Pits and Spoil Banks	x		x				x	rec.		
23	Illumination and Night Work	x						.	rec.		
24	Electrical Hazards	x	x		x			x	rec.		x

PARTS 46 AND 48 SURFACE MINE TRAINING – REQUIRED SUBJECTS

(Best Effort Summary Only – Accurate Information is Available in 30 CFR Parts 46 and 48)

		24 HOUR NEW MINER TRAINING		NEWLY EMPLOYED EXPERIENCED MINER TRAINING		TASK TRAINING (NEW or CHANGES)****		8 HOUR ANN. REFRESHER TRAINING		HAZARD TRAINING	
	TRAINING AREAS	PART 48	PART 46	PART 48	PART 46	PART 48	PART 46	PART 48	PART 46	PART 48	PART 46
25	Prevention of Accidents			x				x	rec.		
26	Health	x		x				x	rec.		
27	Explosives	x						x	rec.		
28	Mobile Equipment hazards		x		x				rec.		
29	Conveyor System Hazards								rec.		
30	Crane Hazards								rec.		
31	Crusher Hazards								rec.		
32	Excavator Hazards								rec.		
33	Dredge Hazards								rec.		
34	Maintenance and Repair (Hand tools and Welding Equipment.								rec.		
35	Material Handling								rec.		
36	Fall Prevention and Protection								rec.		
37	Machine Guarding								rec.		
38	Information or Instructions on hazards person exposed to at the mine and applicable emergency procedures.										x
39	Powered Haulage Hazards										x
40	Other special safety procedures										x
41	Unique Geologic and Environmental Cond.										x
42	Restricted Areas										x
43	Warning and Evacuation Signals										x
44	Ground Control (highwalls)	x		x				x	rec.		
45	Supervised Operation During Production					x^1					
46	New or Modified Machines and Equip. Training					x^1					
47	Other training Required by District	x		x		x^1		x		x	

* Only for miner who returns to same mine within 12 months and the only course he/she must take, other than missed parts of annual refresher training.

** Hazard recognition training required if practice under supervision of a competent person used to fulfill task training requirement.

*** Competent person required (non-production not specified under Part 46).

**** Credit task training under Part 46 to New Miner Training

x^1 Required for miners assigned to new work tasks as mobile equipment operators, drilling machine operators, haulage and conveyor systems operators, ground control machine operators, and those in blasting operations.

'rec.' stands for 'recommended' topic area. These are topics that are not required by law but can be used to fulfill training requirements.

Note – Add the Following Pages to Your Part 46 Plan if Michigan Technological University or one of its Subcontractors is Training You.

Annual Refresher Training

Subject	Check if subject applies	Competent Organization(s)**	Competent Person(s) or Organization(s)
Changes Adversely Effecting S&H (Required Training) **& Other Site-Specific Training**	X	**St. Grants Prog – MTU***	
Special Equipment, Materials & Conditions	X	**St. Grants Prog – MTU***	
Mandatory Safety & Health Standards	X	**St. Grants Prog – MTU**	
Lifesaving First Aid Skills	X	**St. Grants Prog – MTU**	
Escape and Emergency Evac., Firewarning & Firefighting,	X	**St. Grants Prog – MTU***	
Guarding	X	**St. Grants Prog – MTU**	
Fall Prevention & Fall Protection	X	**St. Grants Prog – MTU**	
Lockout-Tagout	X	**St. Grants Prog – MTU***	
Welding & Pressure Vessels	X	**St. Grants Prog – MTU**	
Materials Handling	X	**St. Grants Prog – MTU**	
Rigging	X	**St. Grants Prog – MTU**	
Mobile Equipment	X	**St. Grants Prog – MTU**	
Transportation Systems & Controls	X	**St. Grants Prog – MTU***	
Electrical Hazards	X	**St. Grants Prog – MTU**	

*** Requires assistance and (or) information provided by mine**

**** The State Grants Program at Michigan Technological University may be reached to do your training by calling Dave Carlson at 906/487-2453 or email** dcarlson@mtu.edu

Annual Refresher Training Continued

	Subject	Check if subject applies	Competent Organization(s)**	Competent Person(s) or Organization(s)
	Ground Control & Water Hazards	**X**	**St. Grants Prog – MTU***	
	Housekeeping & Fire Prevention	**X**	**St. Grants Prog – MTU**	
	Respirators	**X**	**St. Grants Prog – MTU**	
	Hearing Conservation Program	**X**	**St. Grants Prog – MTU**	
	Chemical Hazards – HazCom	**X**	**St. Grants Prog – MTU**	

*** Requires assistance and (or) information provided by mine**
**** The State Grants Program at Michigan Technological University may be reached to do your training by calling Dave Carlson at 906/487-2453 or email** dcarlson@mtu.edu

ANNUAL REFRESHER TRAINING PAGE 1

Note that it is very important that **each annual refresher training** session have **at least one person assigned by each of the mines represented,** who is knowledgeable and ready to discuss site-specific hazard and hazards resulting from changes that have taken place at the mine during the past year. Some, but not all of the topics the mine person may need to discuss are:

1. New processes, stationary equipment, and mobile equipment.
2. New traffic patterns
3. Visibility and illumination around mobile equipment.
4. Loadout area and customer concerns
5. New ground and highwall conditions.
6. Road condition concerns (mud, dust, hills, curves, blind spots).
7. Power line placement concerns.
8. New electrical hazards or lockout/tagout programs.
9. Access to new difficult-to-reach locations.
10. Areas miners shouldn't enter.
11. New potential fall hazards.
12. New potential drowning hazards.

NOTE: Annual Refresher Training can be conducted either as a single 8-hour session or in periodic meetings throughout the year that are a minimum length of ½ hour each. If you are training your people in periodic meetings throughout the year, complete the certificate entitled "Training Roster/Certificate for Annual Refresher Training in Short Segments Throughout the Year"(request copy from Dave Carlson – 906/487-2453, if not attached to this plan).

The trainer will use lecture, discussion, videos, overheads, Powerpoint presentations, games or other means to present the approved 8 hours of Annual Refresher training in the following topics. Each training session will be presented to encourage personal responsibility for safety. Each participant will be expected to demonstrate enhanced skills and knowledge of the topics presented. Other topics will be made available upon request by the mine operator, program policy bulletins, updates on accidents, or materials required by the north central district manager.

#1 Changes at the Mine Adversely Affecting Safety and Health – 5 min to 2 hours

#2 Special Mine Equipment (Cranes, dredges, draglines, excavators, drilling & blasting) – 5 min to 2 hours

 # 3 Mandatory Health & Safety Standards (15 to 45 minutes) 15 min to 2 hours
Pertinent Regulations: Title 30 CFR. Parts 47, 48, 56 and 62.

 # 4 Lifesaving First-Aid Skills -- 20 min to 6 hours
Fundamental topics following the American Red Cross Check-Call-Care protocol. Emphasis on performing patient assessment and artificial respiration; controlling bleeding; and treating shock, wounds, burns, and musculoskeletal injuries.

ANNUAL REFRESHER TRAINING PAGE 2

#5 Escape and Emergency Evacuation Plans, Fire-warning and Fire-fighting -- 10 min to 1 hour

Lists of phone numbers to call in emergencies and locations and markings for phones/radios, fire extinguishers and hoses, alarms, evacuation procedures, exit markings, providing information to community emergency services, classification of fires, types/location/use of extinguishers, alarm systems, employee instructions, communications.

#6 Accident Prevention Techniques – 15 min to 4 hours

a. Guarding and access (Crushers, conveyors, screens and other stationary equipment)

b. Maintenance and Repair –

(1) Fall Protection and Prevention
(2) Lockout/Tagout
(3) Cutting & Welding
(4) Material Handling
(5) High pressure safety.
(6) Rigging

c. Transportation Systems and Controls
Mobile equipment including loaders, railway vehicles, trucks, personnel carriers, dozers -- pre-shift inspection, signs and signals, alarms, communication systems, haulageways, hills, curves overhead lines, roads, berms, visibility.

d. Electrical Hazards

e. Ground Control and water hazards
Highwalls, stockpiles, spoil banks, pits, and water hazards.

f. Fire prevention and housekeeping, fueling and other sources of fire such as electrical & welding, flammable materials.

#7 Health Protection Skills 15 min to 2 hours

a. Respiratory devices and airborne contaminants.
b. Hearing Conservation.
c. Chemical Hazards -- Hazard Communication
d. Back Injury Protection

Evaluation of the miners' achievement of the objectives will be made by oral discussions, question-answer sessions and written short quizzes. Clients will be asked to limit class sizes to a maximum of 30 students if possible, or to provide special facilities for classes larger than 30. When the 3-hour first aid is taught, clients will be asked to limit the class size to 14 or less or provide needed assistance.

ANNUAL REFRESHER TRAINING PAGE 3

Sample 3-Year Plan Used By Michigan Technological University

Main Topic areas	Lesson Titles	Subjects Addressed	Times are avg. Year 1	Year 2	Year 3	Teaching Methods	Eval. matls
Mine Specific Topics	Changes Adversely Effecting S&H & Other Site-Specific Training	Mine-Specific Information	0.5	0.5	0.5	Lecture Discuss	Oral or Written Testing
	Special Equipment, Materials & Conditions	Cranes, dredges, draglines, excavators, boats, drilling/blasting, confined spaces & contractor equipment.	0.5	0.5	0.5	Lecture Discuss	Oral or Written Testing
Mandatory Health & Safety Standards	New standards, top MSHA citations for prev. year	CFR 30 -- Parts 47,48,56, and 62	0.5	0.5	0.5	Lecture Discuss	Oral or Written Testing
Lifesaving First Aid Skills	MTU Certified First Aid	MTU First Aid Course - per 56.18010	3			Lecture Practice	Oral or Written Testing
	First Aid/Emergency Resp. Review	First Aid Review	0.5	0.5	0.5	Lecture Discuss	Oral or Written Testing
Escape and Emergency Evac., Fire-warning & Firefighting	Responding to Emergencies	Emergencies -- medical, fire, weather, violence. Getting assistance, community services, fire extinguishers, alarms, evacuation routes & markings, violent weather.	0.25	0.25	0.5	Lecture Discuss	Oral or Written Testing
Accident Prevention Techniques	Guarding	Conveyors, crushers, screens, guarding, access	0.25	0.25	0.25	Lecture Discuss	Oral or Written Testing
	Fall Protection	Fall Protection & Prevention		0.5		Lecture Discuss	Oral or Written Testing
	Lockout - Tagout	Lockout/Tagout	0.5	0.5	1	Lecture Discuss	Oral or Written Testing

ANNUAL REFRESHER TRAINING PAGE 4

Sample 3-Year Plan Used By Michigan Technological University Continued

Main Topic areas	Lesson Titles	Subjects Addressed	Times are avg. Year 1	Year 2	Year 3	Teaching Method	Eval. matls
Accident Prevention Techniques Continued	Welding & Pressure Vessels	Cutting, Welding, Pressure Effects -- incl. Tires, air tanks, compr. Gases, hydraulic lines (whipping hoses, hot oil), fuel tanks, water tanks, sealed drums.	0.25	0.5	0.25	Lecture Discuss	Oral or Written Testing
	Material Handling	Material Handling			0.5	Lecture Discuss	Oral or Written Testing
	Rigging	Rigging			0.5	Lecture Discuss Demo	Oral or Written Testing
	Mobile Equipment	Mobile equipment including loaders, railway vehicles, trucks, personnel carriers, dozers -- pre-shift inspection, signs and signals, alarms, communication systems, etc.	0.25	0.5	0.5	Lecture Discuss	Oral or Written Testing
	Transportation Systems & Controls	Haulageways, roads, hills, curves, signs, berms, overhead lines, visibility etc.		0.5	0.5	Lecture Discuss	Oral or Written Testing
	Electrical Hazards	Basics, grounding, testing, precautions		1		Lecture Discuss	Oral or Written Testing
	Ground Control and Water Hazards	Highwalls, stockpiles, spoil banks, pits, and water hazards			0.5	Lecture Discuss	Oral or Written Testing
	Fire Prevention & Housekeeping	Fueling electrical & welding fires, flammable materials.		0.5		Lecture Discuss	Oral or Written Testing
Health Protection Skills	Respirators	Dust		0.5		Lecture Discuss Demo	Oral or Written Testing
	Hearing Conservation Program	As reqd. by Part 62	0.5			Lecture Discuss	Oral or Written Testing
	Hazard Communication	As required by Part 47			0.5	Lecture Discuss	Oral or Written Testing
		Total Time Est. for Instruction	7	7	7		
		Total Training Time Requirement	8	8	8		

The following forms meet MSHA requirements for the various types of training records.

NEW MINER TRAINING RECORD/CERTIFICATE

Miner's Full Name (Print) _____

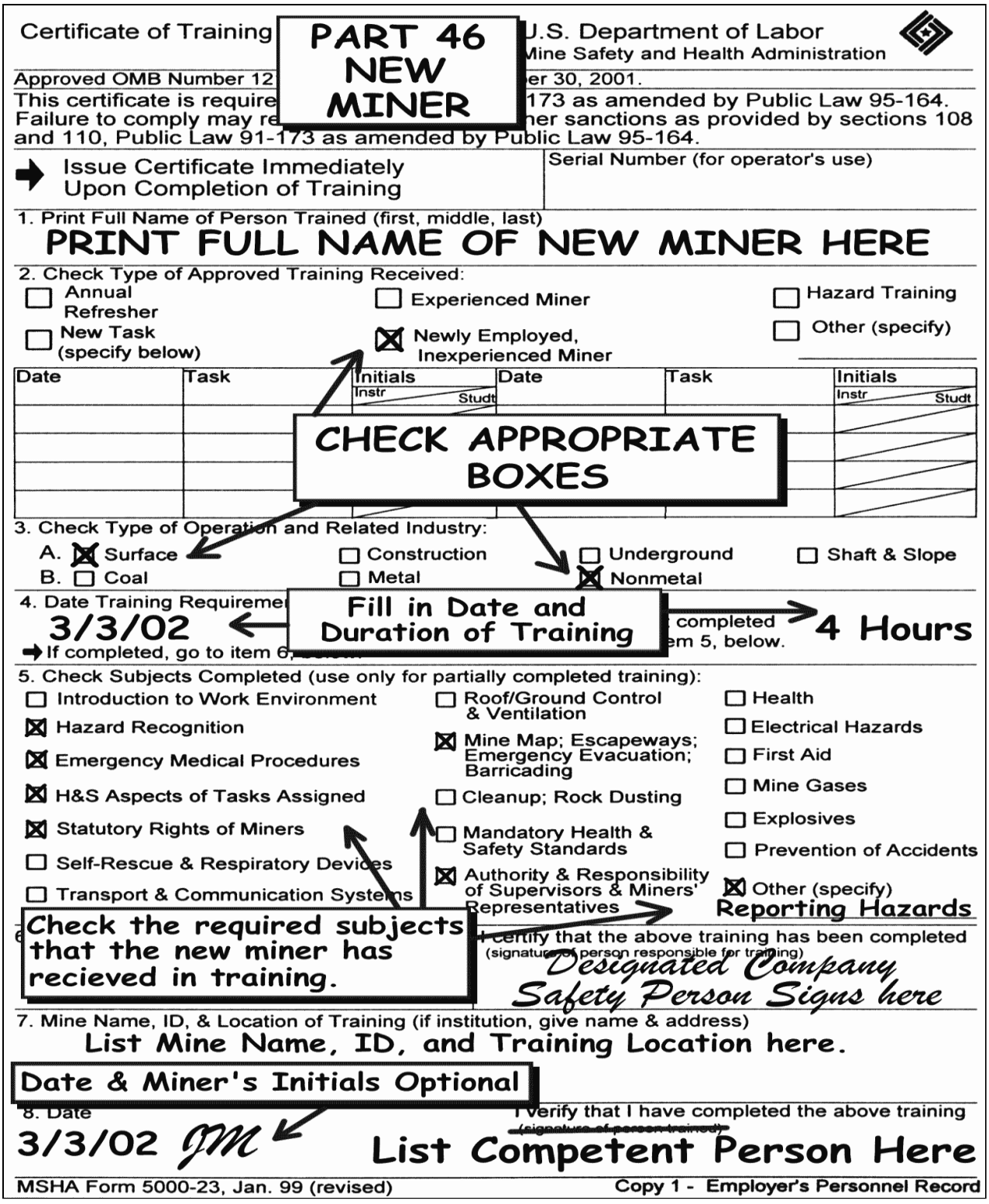
Mine or Contractor Name _____ ID# _____

Subject 30 CFR Part 46.5	Course Length	Date	Competent Person	Location (Name & Address if Institution)	Miner's Initials
The miner received no less than 4 hours training in the following, before beginning work:					
(b) (1) Introduction to work environment, mine tour, mining method/operation					
(b)(2) Instruction on recognition and avoidance of electrical and other hazards					
(b)(3) Emergency procedures, escape, and firefighting					
(b)(4) Health and safety aspects of tasks assigned including **HazCom Training**					
(b)(5) Instruction on statutory rights of miners and their representatives					
(b)(6) Authority & responsibility of supervisors and miners' representatives					
(b)(7) Introduction to your rules and procedures for reporting hazards					
No later than 60 days:					
(c)(1) Self-rescue, respiratory devices, if used					
(c)(2) First aid					
No later than 90 days (balance of 24 hours including the following subjects):					

False certification is punishable under section 110 (a) and (f) of the Federal Mine Safety and Health Act
I certify that the above training has been completed

_____ _____
(Signature of person responsible for health and safety training) (Date)

Correctly Completed Form 5000-23 Certificate Used for Part 46 New Miner Training



NEWLY-HIRED EXPERIENCED MINER TRAINING RECORD/CERTIFICATE

Miner's Full Name (Print) _____

Mine or Contractor Name _____ID# _____

Subject 30 CFR Part 46.6	Course Length	Date	Competent Person	Location (Name & Address if Institution)	Miner's Initials
The miner has received the following training before beginning work:					
(b)(1) Introduction to work environment, mine tour, mining method/operation					
(b)(2) Instruction on recognition and avoidance of electrical and other hazards					
(b)(3) Emergency procedures, escape, and firefighting					
(b)(4) Health and safety aspects of tasks assigned including HazCom Training					
(b)(5) Instruction on statutory rights of miners and their representatives					
(b)(6) Authority & responsibility of supervisors and miners' representatives					
(b)(7) Introduction to your rules and procedures for reporting hazards					
No later than 60 days:					
(c) Self-rescue, respiratory devices, if used					

False certification is punishable under section 110 (a) and (f) of the Federal Mine Safety and Health Act
I certify that the above training has been completed

_____

(Signature of person responsible for health and safety training) (Date)

NEW TASK TRAINING RECORD/CERTIFICATE – *Note that HazCom Training Must be Included in all New Task Training*

Miner's Full Name (Print) _____

Mine or Contractor Name _____ID# _____

New Task 30 CFR Part 46.7	Duration of Training	Competent Person	Date	Location (Name & Address if Institution)	Miner's Initials
The miner received the following training before performing a new task, or a change occurred in an assigned task that affects health and safety risk:					

False certification is punishable under section 110 (a) and (f) of the Federal Mine Safety and Health Act
I certify that the above training has been completed

_____ _____
(Signature of person responsible for health and safety training) (Date)

Task Training Checklist & Certificate

Name of Trainee:			
Mine (or Contractor) Name:	I.D. #:		
Location of Training:	Initial Training Date:		
Competent Trainer:	NOTE: If more than one trainer will		
Competent Trainer:	be instructing this task, each trainer		
Competent Trainer:	should initial the step completion		
	box, rather than simply checking it.		
Task Name:			
Task Description:			
Lesson Plan Location (See company Training Plan):			
Equipment Description (If Applicable):			
Equipment Model Name & Number:			
Equipment Manufacturer/Dealer Information:			
	Time		
	for	Step	
Task Training Steps	step	Completed	
1. Statement of the Purpose of Training (Read statement).			
2. Brief summary of the purpose of the task and its steps. (Read task description.)			
3. Demonstration of correct performance of the task. (Demonstrate task.)			
4. Task & Equipment (Review the following.)			
a) Equipment & Operator Safety Manuals.			
b) Correct Use/Operation Procedures for this mine site.			
c) Operator Maintenance Procedures.			
d) Warnings (MSDSs, Signs, Decals, Alarms, Lights)			
e) Special Company Policies/Procedures (Including the following.)			
i) Procedures for reporting of safety concerns.			
ii) Procedures for removing unsafe equipment from production.			
iii) Emergency Procedures			
5. Task Safety & Health Analysis (Use classroom discussion and/or job observation)			
6. Job Steps, Hazards, Remedies (Review Job Safety Analysis - JSA)			
7. HazCom – chemical hazards & protective measures, location and use of MSDSs, and contents of written HazCom program.			
8. Evaluate classroom knowledge (Written (or oral) testing.)			
9. Supervised Practice (If done by different competent person, note it on this form.)			
10. Evaluate Performance (Task must be performed to competent persons satisfaction.)			
11. Record Keeping			
Total Training Time (In Hours):			
"Trainee is familiar with information presented and has demonstrated the ability to properly perform this task in a safe and healthful manner." (Competent Person Please Initial)			
False Certification is punishable under section 110 (a) and (f) of the Mine Safety and Health Act			
I certify that the above training has been completed.			
(Signature of person responsible for safety and health training on the mine's Training Plan		Date:	

ANNUAL REFRESHER TRAINING RECORD/CERTIFICATE

Miner's Full Name (Print) _____

Mine or Contractor Name _____ID#_____

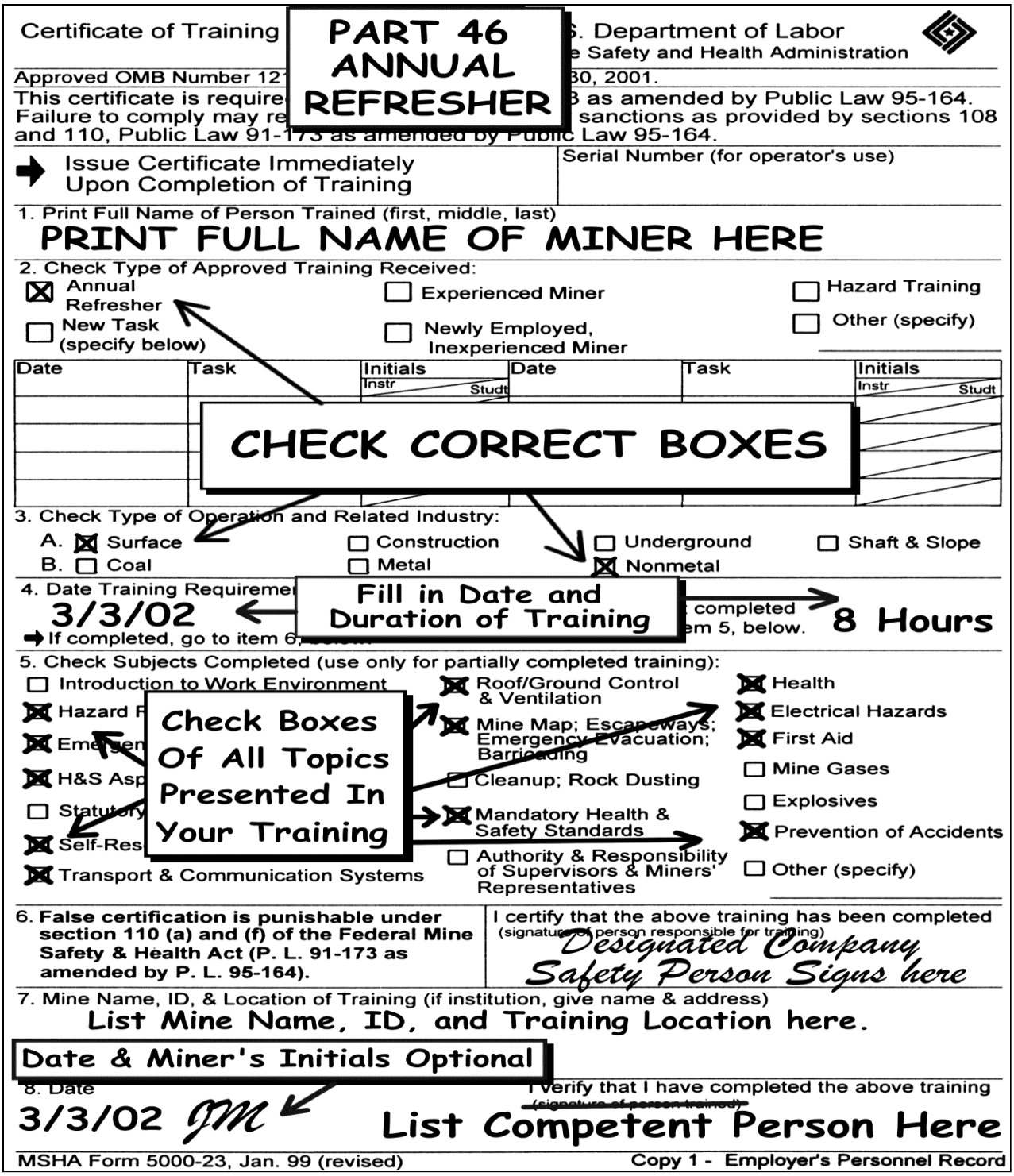
Subject 30 CFR Part 46.8	Subject Length	Date	Competent Person	Location (Name & Address if Institution)	Miner's Initials
The miner received no less than 8 hours of annual refresher training in the following:					
Instruction on changes at the mine that could adversely affect the miner's health or safety					
Health and safety subjects relevant to mining operations at the mine					
(For recommended subjects see 46.8 (c))					

False certification is punishable under section 110 (a) and (f) of the Federal Mine Safety and Health Act
I certify that the above training has been completed

_____ _____

(Signature of person responsible for health and safety training) (Date)

Correctly Completed Form 5000-23 Certificate Used for Part 46Annual Refresher Training



Correctly Completed Form 5000-23 Certificate Used for Part 48 Training

Certificate of Training **PART 48** U.S. Department of Labor
Mine Safety and Health Administration

Approved OMB Number 1219-0070, Expires September 30, 2001.

This certificate is required under Public Law 91-173 as amended by Public Law 95-164. Failure to comply may result in penalties and other sanctions as provided by sections 108 and 110, Public Law 91-173 as amended by Public Law 95-164.

➡ Issue Certificate Immediately Upon Completion of Training

Serial Number (for operator's use)

1. Print Full Name of Person Trained (first, middle, last)

PRINT FULL NAME OF TRAINEE HERE

2. Check Type of Approved Training Received:

☐ Annual Refresher ☐ Experienced Miner ☐ Hazard Training

☐ New Task (specify below) ☐ Newly Employed, Inexperienced Miner ☐ Other (specify)

Date	Task	Initials	Date	Task	Initials

CHECK BOXES THAT APPLY TO TYPE OF TRAINING AND YOUR TYPE OF OPERATION

3. Check Type of Operation and Related Industry:

A. ☐ Surface ☐ Construction ☐ Underground ☐ Shaft & Slope

B. ☐ Coal ☐ Metal ☐ Nonmetal

4. Date Training Requirements Completed

3/3/02 ← **DATE OF TRAINING**

➡ If completed, go to item

☐ Check if not completed and go to item 5, below.

5. Check Subjects Comple completed training):

☐ Introduction to Work Environment ☐ Roof/Ground Control & Ventilation ☐ Health

☐ Hazard Recognition ☐ Mine Map; Escapeways; Emergency Evacuation; Barricading ☐ Electrical Hazards

☐ Emergency Medical Procedures ☐ First Aid

☐ H&S Aspects of Tasks Assigned ☐ Cleanup; Rock Dusting ☐ Mine Gases

☐ Statutory Rights of Miners ☐ Mandatory Health & Safety Standards ☐ Explosives

☐ Self-Rescue & Respiratory Devices ☐ Prevention of Accidents

☐ Transport & Communication Systems ☐ Authority & Responsibility of Supervisors & Miners' Representatives ☐ Other (specify)

6. **False certification is punishable under section 110 (a) and (f) of the Federal Mine Safety & Health Act (P. L. 91-173 as amended by P. L. 95-164).**

I certify that the above training has been completed
(signature of person responsible for training)

Certified Trainer or Responsible Person Signature

7. Mine Name, ID, & Location of Training (if institution, give name & address)

FILL IN MINE NAME, I.D, AND ACTUAL LOCATION OF TRAINING

8. Date

3/3/02 ← **DATE OF TRAINING**

I verify that I have completed the above training
(signature of person trained)

Miner's Signature

MSHA Form 5000-23, Jan. 99 (revised) Copy 1 - Employer's Personnel Record

SITE-SPECIFIC HAZARD AWARENESS TRAINING RECORD/CERTIFICATE

Miner's Full Name (Print) _____

Mine or Contractor Name _____**ID#**

Mine Site and Area for Which Training is Provided

Location: _____

Length of Training: _____

Date Training Provided: _____

Competent Person Providing
the Training: _____

Miner's Initials: _____

False certification is punishable under section 110 (a) and (f) of the Federal Mine Safety and Health Act
I certify that the above training has been completed

_____

(Signature of person responsible for health and safety training)

Site-Specific Hazard Awareness Training Record/Certificate

Miner's Full Name (Print)_____

Mine or Contractor Name _____ID#_____

Mine Site and Area for Which Training is Provided

Location: _____

Length of Training: _____

Date Training Provided: _____

Competent Person Providing the Training: _____

Training Checklist

__Hazard Recognition and Avoidance
__Emergency Evacuation Plans
__Traffic Patterns and Control
__Electrical Hazards
__Information or instructions on hazards persons exposed to & applicable emergency procedures.
__Powered Haulage Hazards
__Unique Geologic and Environmental Conditions.
__Restricted Areas
__Warning and Evacuation Signals
__Other special safety procedures

Miner's Initials: _____

False certification is punishable under section 110 (a) and (f) of the Federal Mine Safety and Health Act
2I certify that the above training has been completed

_____
(Signature of person responsible for health and safety training) (Date)

Mine Site Hazard Training Checklist and Record

Name of Person Trained (Print): _____
Mine or Contractor
Name: _____MSHA ID #: _____
Training Location: _____
Date of training: _____
Length of training, minutes: _____
Competent Person Providing Training: _____
Miner's Initials: _____

After receiving the safety information, check off that safety topic. Then initial above.

1. GENERAL SAFETY INFORMATION FOR ALL PERSONS ENTERING THIS MINE SITE.

- ☐ Signs: Non-Standard Traffic Signs & General Warning Signs
- ☐ Traffic Patterns: Right of Way, Haulage Roads, Designated Parking Areas
- ☐ Reporting Emergencies: Emergency Numbers, Directing help to your location
- ☐ Mine Evacuation: Where to report to in case of evacuation
- ☐ Minimum Required Personal Protective Equipment
- ☐ Company Drug, Alcohol & Smoking Policy
- ☐ Trespassing & Recreational Activities
- ☐ Overhead Power Lines

2. PLANT SPECIFIC HAZARD INFORMATION

- ☐ Stationary Machinery: Guarding, Warning Signs
- ☐ Confined Spaces
- ☐ Electrical

3. PIT/QUARRY HAZARD INFORMATION

- ☐ Mobile Equipment: Operator Visibility, Audible Warning Signals
- ☐ Traffic Pattern: Restricted & Forbidden Areas
- ☐ Hazardous Ground Conditions
- ☐ Blasting

4. MAINTENANCE SHOP HAZARD INFORMATION

- ☐ Shop Cranes/Suspended Loads
- ☐ Welding
- ☐ Hazardous Chemicals and Other Materials

5. POWER PLANT HAZARD INFORMATION

- ☐ Electrical Hazards

6. TAILINGS & WASTE TREATMENT AREA HAZARD INFORMATION

- ☐ Hazardous Waste
- ☐ Water Hazards

I have received the above training:

False certification is punishable under section 110 (a) and (f) of the Federal Mine Safety and Health Act.

I certify that the above training has been completed – _____
Signature of Person Responsible for Health and Safety Designated in Training Plan (Note that record and certification are required for miners only – see definition of "miner")

Section 8

Accident, Injury, Illness and Quarterly Employment Reports

Action Items

Part 50 - Accident, Injury, and Illness Report – Form 7000-1

Steps to be taken when an accident occurs (see the 12 incidents that are considered to be an "accident" under "Definitions" in this section):

1. Contact your local MSHA field or district office **immediately (within 15 minutes to avoid a large fine)** by phone and report the accident rather than trying to determine if it is "immediately reportable". This will save you time and the MSHA contact can provide you with instructions immediately as to what you need to do.
2. Fill out form 7000-1 for all reportable accidents, injuries and illnesses, but **do not** fill out 7000-1 for those that are not reportable. You may need to call MSHA for help in determining if a particular case is reportable.
3. Do your own accident/occupational injury investigation and prepare a report for your file. Keep this report -- it must be available to MSHA on request.
4. Turn in the form 7000-1 within 10 days. If the 'Return to Duty' information is not yet available, send the form in anyway, but retain a copy to send later when the 'Return to Duty' information becomes available.

Part 50 - Quarterly Employment Report – Form 7000-2

1. Follow instructions and cautions contained here and on the form to complete it correctly.
2. Reports must be turned in quarterly on or before the 15th of April, July, October, and January.

Section 8

Accident, Injury and Illness Report (Form 7000-1)
&
Mine Quarterly Employment Report (Form 7000-2)

Contents of This Section

Quiz

1. There are ___ different types of incidents which MSHA defines as mine "accidents" in 30 CFR Part 50.2.
2. When an accident occurs, you must call the MSHA district or subdistrict office immediately. True___ False___.*
3. The operator must investigate every accident and injury, which occurs at the mine. True___ False____.
4. It is almost never acceptable to use the form 7000-1 MSHA Accident, Injury and Illness Report form to investigate an accident. True___ False___.*
5. You are not allowed to alter an accident scene until all investigations have been completed without exception. True___ False___. *
6. First aid need not be reported on Form 7000-1. True___ False___.
7. First aid means one-time treatment and any follow-up visit for observational purposes, of a minor injury. True___ False___.
8. For all reportable accidents, injuries or illnesses, a copy of form 7000-1 must be submitted to MSHA within: a) 5 days___, b)10 days ___, c)20 days___, d)1 month ___.
9. MSHA's yellow-jacket booklet gives instructions to help you determine if an accident, injury, or illness is reportable. True___ False___.*
10. Quarterly Employment reports must be postmarked no later than the last day of March, June, September, and December. True___ False___. *
11. You must retain copies of your quarterly employment reports for 5 years. True___ False___.
12. Total employee-hours worked during the quarter include paid leave. True___ False___.
13. The number of employees reported is obtained by adding the number employed during each pay period, dividing by the number of pay periods, and rounding to the nearest whole number. True___ False___.
14. The number of injuries which occurred during the quarter is entered into the Quarterly Employment Report under "Other Reportable Data". True___ False___.*
15. The incidence rate is the average number of cases for 200,000 hours worked and is obtained by multiplying the total number of cases by 200,000 and dividing by the total number of hours worked. True___ False___.*
16. The severity rate is the number of days of lost or restricted time for 200,000 hours worked and is obtained by multiplying this total number of days by 200,000 and dividing by the total number of hours worked. True___ False___.
17. A contractor should use the ID number for the mine where the work is actually done. True___ False___.

*Discussion of Answers:

1. 12
2. True -- If you call the MSHA field office, they can help you determine at once whether or not the accident is reportable. MSHA does **not** want accidents reported that are not reportable. The MSHA contact will be able to help you determine if the accident is reportable.
4. True -- Only a mine with less than 20 employees reporting an occupational injury not related to an accident can use the form 7000-1 as a report of the accident investigation. See 50.2h (1) through (12) for the types of incidents which MSHA considers to be an "accident".
5. False – Need MSHA permission except to the extent necessary to rescue or recover an individual, prevent or eliminate an imminent danger, or prevent destruction of mining equipment.
9. Contact Dave Carlson (dcarlson@mtu.edu) for an electronic copy of this booklet—also available on MSHA's Internet site (msha.gov).
10. Quarterly employment reports are due by the 15th of the month following the quarter (Apr 15, July 15, Oct 15, and Jan 15).
14. MSHA crosschecks by computer to ensure that the number of injuries agrees with the number reported on form 7000-1.
15. Make sure you report all of the hours worked or your reported incidence rate will be higher than the actual rate, and an unusually high incidence rate may trigger additional MSHA inspections.

30 CFR § 50.2

Definitions.

As used in this part:

(a) *Mine* means: (1) An area of land from which minerals are extracted in nonliquid form or, if in liquid form, are extracted with workers underground (2) private ways and roads appurtenant to such area, and (3) lands, excavations, underground passageways, shafts, slopes, tunnels and workings, structures, facilities, equipment, machines, tools, or other property including impoundments, retention dams, and tailings ponds, on the surface or underground, used in, or to be used in, or resulting from, the work of extracting such minerals from their natural deposits in non-liquid form, or if in liquid form, with workers underground, or used in, or to be used in, the milling of such minerals, or the work of preparing coal or other minerals, and includes custom coal preparation facilities.

(b) *Work of preparing the coal* means the breaking, crushing, sizing, cleaning, washing, drying, mixing, storing, and loading of bituminous coal, lignite, or anthracite, and such other work of preparing such coal as is usually done by the operator of the coal mine.

(c) *Operator* means

(1) Any owner, lessee, or other person who operates, controls, or supervises a coal mine; or,

(2) The person, partnership, association, or corporation, or subsidiary of a corporation operating a metal or nonmetal mine, and owning the right to do so, and includes any agent thereof charged with responsibility for the operation of such mine.

(d) *Miner* means any individual working in a mine.

(e) *Occupational injury* means any injury to a miner which occurs at a mine for which medical treatment is administered, or which results in death or loss of consciousness, inability to perform all job duties on any day after an injury, temporary assignment to other duties, or transfer to another job.

(f) *Occupational illness* means an illness or disease of a miner which may have resulted from work at a mine or for which an award of compensation is made.

(g) *First aid* means one-time treatment, and any follow-up visit for observational purposes, of a minor injury.

(h) *Accident* means

(1) A death of an individual at a mine;

(2) An injury to an individual at a mine which has a reasonable potential to cause death;

(3) An entrapment of an individual for more than thirty minutes;

(4) An unplanned inundation of a mine by a liquid or gas;

(5) An unplanned ignition or explosion of gas or dust;

(6) An unplanned mine fire not extinguished within 30 minutes of discovery;

(7) An unplanned ignition or explosion of a blasting agent or an explosive;

(8) An unplanned roof fall at or above the anchorage zone in active workings where roof bolts are in use; or, an unplanned roof or rib fall in active workings that impairs ventilation or impedes passage;

(9) A coal or rock outburst that causes withdrawal of miners or which disrupts regular mining activity for more than one hour;

(10) An unstable condition at an impoundment, refuse pile, or culm bank which requires emergency action in order to prevent failure, or which causes individuals to evacuate an area; or, failure of an impoundment, refuse pile, or culm bank;

(11) Damage to hoisting equipment in a shaft or slope which endangers an individual or which interferes with use of the equipment for more than thirty minutes; and

(12) An event at a mine which causes death or bodily injury to an individual not at the mine at the time the event occurs.

30 CFR § 50.10

Immediate notification.

The operator **shall immediately contact MSHA at once without delay and within 15 minutes** at the toll-free number, 1-800-746-1553, once the operator knows or should know that an accident has occurred.

30 CFR § 50.11

Investigation.

(a) After notification of an accident by an operator, the MSHA District Manager will promptly decide whether to conduct an accident investigation and will promptly inform the operator of his decision. If MSHA decides to investigate an accident, it will initiate the investigation within 24 hours of notification.

(b) Each operator of a mine shall investigate each accident and each occupational injury at the mine. Each operator of a mine shall develop a report of each investigation. No operator may use Form 7000-1 as a report, except that an operator of a mine at which fewer than twenty miners are employed may, with respect to that mine, use Form 7000-1 as an investigation report respecting an occupational injury not related to an accident (see definition of ***accident*** above). No operator may use an investigation or an investigation report conducted or prepared by MSHA to comply with this paragraph. An operator shall submit a copy of any investigation report to MSHA at its request. Each report prepared by the operator shall include,

(1) The date and hour of occurrence;

(2) The date the investigation began;

(3) The names of individuals participating in the investigation;

(4) A description of the site;

(5) An explanation of the accident or injury, including a description of any equipment involved and relevant events before and after the occurrence, and any explanation of the cause of any injury, the cause of any accident or cause of any other event which caused an injury;

(6) The name, occupation, and experience of any miner involved;

(7) A sketch, where pertinent, including dimensions depicting the occurrence;

(8) A description of steps taken to prevent a similar occurrence in the future; and

(9) Identification of any report submitted under §50.20 of this part.

30 CFR § 50.12

Preservation of evidence.

Unless granted permission by an MSHA District Manager or Subdistrict Manager, no operator may alter an accident site or an accident related area until completion of all investigations pertaining to the accident except to the extent necessary to rescue or recover an individual, prevent or eliminate an imminent danger, or prevent destruction of mining equipment.

[42 FR 65535, Dec. 30, 1977; 43 FR 1617, Jan. 11, 1978]

Subpart C--Reporting of Accidents, Injuries, and Illnesses

Form 7000-1 (Accident, Injury & Illness Report)

For Online Filing of the Form 7000-1 use the following link:
http://www.msha.gov/forms/elawsforms/7000-1.htm

Some DEFINITIONS you need to know.

(1) "Coal or other mine" means (a) an area of land from which minerals are extracted in nonliquid form or, if in liquid form, are extracted with workers underground, (b) private ways and roads appurtenant to such area, and (c) lands, excavations, underground passageways, shafts, slopes, tunnels and workings, structures, facilities, equipment, machines, tools, or other property including impoundments, retention dams, and tailings ponds, on the surface or underground, used in, or to be used in, or resulting from, the work of extracting such minerals from their natural deposits in nonliquid form, or if in liquid form, with workers underground, or used in, or to be used in, the milling of such minerals, or the work of preparing coal or other minerals, and includes custom coal preparation facilities. In making a determination of what constitutes mineral milling for purposes of this Act, the Secretary shall give due consideration to the convenience of administration resulting from the delegation to one Assistant Secretary of all authority with respect to the health and safety of miners employed at one physical establishment.

(2) "Operator" means any owner, lessee, or other person who operates, controls, or supervises a coal or other mine or any designated independent contractor performing services or construction at such mine.

(3) "Occupational injury" means any injury to a worker which occurs at a mine for which medical treatment is administered, or which results in death, loss of consciousness, inability to perform ail job duties on any day after an injury, or transfer to another job.

(4) "Occupational illness" means an illness or disease of a worker which may have resulted from work at a mine or for which an award of compensation is made.

(5) "Medical treatment" means treatment, other than first aid, administered by a physician or by a registered medical professional acting under the orders of a physician.

DIFFERENCES BETWEEN MEDICAL TREATMENT AND FIRST AID

Medical treatment includes, but is not limited to, the suturing of any wound, treatment of fractures, application of a cast or other professional means of immobilizing an injured part of the body, treatment of infection arising out of an injury, treatment of bruise by the drainage of blood, surgical removal of dead or damaged skin (debridement), amputation or permanent loss of use of any part of the body, treatment of second and third degree burns. Procedures which are diagnostic in nature are not considered by themselves to constitute medical treatment. Visits to a physician, physical examinations, x-ray examinations, and brief hospitalization for observations, where no evidence of injury or illness is found and no

medical treatment given, do not in themselves constitute medical treatment. However, if scheduled workdays are lost because of hospitalization, the case must be reported. Procedures which are preventative in nature also are not considered by themselves to constitute medical treatment. Tetanus and flu shots are considered preventative in nature. First aid includes any one-time treatment and follow-up visit for the purpose of observation of minor scratches, cuts, burns, splinters, etc. Ointments, salves, antiseptics, and dressings to minor injuries are considered to be first aid.

(1) Abrasions

(i) First aid treatment is limited to cleaning a wound, soaking, applying antiseptic and nonprescription medication, and bandages on the first visit and follow-up visits limited to observation including changing dressing and bandages. Additional cleaning and application of antiseptic constitutes first aid where it is required by work duties that soil the bandage.

(ii) Medical treatment includes examination for removal of imbedded foreign material, multiple soakings, whirlpool treatment, treatment of infection, or other professional treatments and any treatment involving more than a minor spot-type injury. Treatment of abrasions occurring to greater than full skin depth is considered medical treatment.

(2) Bruises

(i) First aid treatment is limited to a single soaking or application ofcold compresses, and follow-up visits if they are limited only to observation.

(ii) Medical treatment includes multiple soakings, draining of collected blood, or other treatment beyond observation.

(3) Burns, Thermal and Chemical (resulting in destruction of tissue by direct contact).

(i) First aid treatment is limited to cleaning or flushing the surface, soaking, applying cold compresses, antiseptics or nonprescription medications, and bandaging on the first visit, and follow-up visits restricted to observation, changing bandages, or additional cleaning. Most first degree burns are amenable to first aid treatment.

(ii) Medical treatment includes a series of treatments including soaks, whirlpool, skin grafts, and surgical debridement (cutting away dead skin). Most second and third degree burns require medical treatment.

(4) Cuts and Lacerations

(i) First aid treatment is the same as for abrasions except the application of butterfly closures for cosmetic purposes only can be considered first aid.

(ii) Medical treatment includes the application of butterfly closures for noncosmetic purposes, sutures (stitches), surgical debridement, treatment of infection, or other professional treatment.

(5) Eye Injuries

(i) First aid treatment is limited to irrigation, removal of foreign material not imbedded in eye, and application of nonprescription medications. A precautionary visit (special examination) to a physician is considered as first aid if treatment is limited to above items, and follow-up visits if they are limited to observation only.

(ii) Medical treatment cases involve removal of imbedded foreign objects, use of prescription medications, or other professional treatment.

(6) Inhalation of Toxic or Corrosive Gases

(i) First aid treatment is limited to removal of the worker to fresh air or the one-time administration of oxygen for several minutes.

(ii) Medical treatment consists of any professional treatment beyond that mentioned under first aid and all cases involving loss of consciousness.

(7) Splinters and Puncture Wounds

(i) First aid treatment is limited to cleaning the wound, removal of foreign object(s) by tweezers or other simple techniques, application of antiseptics and nonprescription medications, and bandaging on the first visit. Follow-up visits are limited to observation including changing of bandages. Additional cleaning and applications of antiseptic constitute first aid where it is required by work duties that soil the bandage.

(ii) Medical treatment consists of removal of foreign objects) by physician due to depth of imbedment, size or shape of object(s), or location of wound. Treatment for infection, treatment of a reaction to tetanus booster, or other professional treatment, is considered medical treatment.

(8) Sprains and Strains

(i) First aid treatment is limited to soaking, application of cold compresses, and use of elastic bandages on the first visit. Follow-up visits for observation, including re-applying bandage, are first aid.

(ii) Medical treatment includes a series of hot and cold soaks, use of whirlpools, diathermy treatment, or other professional treatment.

Specific Instructions for completing the form 7000-1

Section 50.20 of Part 50, Title 30, Code of Federal Regulations, requires a report to be prepared and filed with MSHA of each accident, occupational injury, or occupational illness occurring at your operation. The requirement includes all accidents, injuries, and illnesses as defined in Part 50 whether your employees or a contractor's employees are involved. A Form 7000-1 shall be completed and mailed within ten working days after an accident or occupational injury occurs, or an occupational illness is diagnosed.

This report is required by law (30 U.S.C. §813; 30 C.F.R. Part 50). Failure to report can result in the institution of a civil action for relief under 30 U.S.C. 9818 respecting an operator of a coal or other mine, and assessment of a civil penalty against an operator of a coal or other mine under 30 U.S.C. 9820(a). An individual who, being subject to the Federal Mine Safety and Health Act of 1977 (30 U.S.C. 9801 at seq.) knowingly makes a false statement in any report can be punished by a fine of not more than $10,000 or by imprisonment for not more than 5 years, or both, under 30 U.S.C. §820.(f). Any individual who knowingly and willfully makes any false, fictitious, or fraudulent statements, conceals a material fact, or makes a false, fictitious, or fraudulent entry, with respect to any matter within the jurisdiction of any agency of the United States can be punished by a fine of not more than $10,000, or imprisoned for not more than 5 years, or both, under 18 U.S.C. 91001.

REPORTING INSTRUCTIONS

Form 7000-1 consists of four sheets, an original (page 1) and three copies. The original will be mailed to MSHA, Denver Safety and Health Technology Center. The first copy (page 2) will be mailed to the appropriate local MSHA District or Subdistrict Office. Envelopes are included with the forms for mailing to those offices. If the mailed forms do not show return to duty information on an injured employee, complete and mail the second copy (page 3) to MSHA, Denver Safety and Health Technology Center, when the employee returns to regular job at full capacity or a final disposition is made on the injury or illness. The third copy (page 4) is to be retained at the mine for a period of five years. It is important to remember that a Form 7000-1 is required on each accident as defined in 30 CFR Part 50 whether any person was injured or not. A form is required on each individual becoming injured or ill, even when several were injured or made ill in a single occurrence. The principal officer in charge of health and safety at the mine or the supervisor of the mine area in which the accident, injury, or illness occurred shall be responsible for completing the Form 7000-1. Note: First aid cases (those for which no medical treatment was received, no time was lost, and no restriction of work, motion, or loss of consciousness occurred) need not be reported.

SPECIFIC INSTRUCTIONS

Detailed instructions for completing Form 7000-1 are contained in Part 50. A copy of Part 50 was sent to every active and intermittently active mine and independent mining contractor. If you do not have a copy, you may obtain one from your local MSHA Mine Safety and Health District or Subdistrict Office.

Section A- IDENTIFICATION DATA

Check the report category indicating whether your operation is in the metal/nonmetal mining industry or the coal mining industry.

MSHA ID Number is the number assigned to the operation by MSHA. If you are unsure of your number assignment, contact the nearest MSHA Mine Safety and Health District or Subdistrict Office. Reports on contractor activities at mines must include an MSHA-assigned contractor ID Number as well as the 7-digit operation ID.

Show mine name and company name. Independent contractors should provide the mine name and show the contractor name under "company name. "

Section B- COMPLETE FOR EACH ACCIDENT IMMEDIATELY REPORTABLE TO MSHA

Section B is to be completed only when your operation has an accident that must be reported immediately to MSHA. Circle code 02 "Serious Injury" only if the injury has a reasonable potential to cause death. For additional detail on those specific kinds of accidents see Section 50.10 of Part 50. When it is necessary to complete Section B, circle the applicable accident code; give the name of the investigator (the person heading the investigating team on the accident); show the date the investigation was started; and describe briefly the steps taken to prevent a recurrence of such an accident.

Section C- COMPLETE FOR EACH REPORTABLE ACCIDENT, INJURY, OR ILLNESS

Section C must be completed on each form submitted to MSHA.

Item 5. If you are reporting an occurrence at a surface mine or other surface activity, circle the code which best describes the accident location in (a). Surface Location; do not mark

any codes in (b) or (c). If you are reporting an occurrence in an underground mine, circle the code which best describes the underground location in (b) Underground Location and in (c) Underground Mining Method.

Items 6, 7, and 8. Show the date and time of the occurrence and the time the shift started in which the accident/incident occurred or was observed.

Item 9. Describe fully the conditions contributing to the occurrence. Detailed descriptions of the conditions provide the basis for accident and injury analyses which are intended to assist the mining industry in preventing future occurrences. Please see Part 50 for detail on what your narrative should include.

Item 10. If equipment was involved in the occurrence, name the type of equipment, the manufacturer, and the model number of the equipment.

Item 11. If there was a witness to the occurrence, give the name of the witness.

Item 12. If the occurrence resulted in one or more injuries, report the number. A separate report must be made on each injured person.

Item 13. Show the name of the injured person. [Note: In these instructions, "injured person" means a person either injured or ill.]

Item 14. Indicate the sex of the injured person.

Item 15. Show the date of birth of the injured person.

Item 16. Show the last four digits of the injured person's Social Security Number.

Item 17. Give the regular job title of the injured person at the time he was injured.

Item 18. Check this box if the injury or illness resulted in death.

Item 19. Check this box if the injury or illness resulted in a permanent disability. A permanent disability is any injury or occupational illness other than death which results in the loss (or complete loss of use) of any member (or part of a member) of the body, or a

permanent impairment of functions of the body, or which permanently and totally incapacitates the injured person from following any gainful occupation.

Item 20. Name the object or substance that directly caused the injury or illness.

Item 21. Report the nature of injury or illness by naming the illness; or for injuries, by using common medical terms such as puncture wound, third degree burn, fracture, etc. For multiple injuries, enter the injury which was the most serious. Avoid general terms such as hurt, sore, sick, etc.

Item 22. Name the part of body with the most serious injury.

Item 23. Occupational illness is any abnormal condition or disorder, other than one resulting from an occupational injury, which falls into the following categories:

Code 21 - Occupational Skin Diseases or Disorders. Examples: Contact dermatitis, eczema, or rash caused by primary irritants and sensitizers or poisonous plants; oil acne; chrome ulcers; chemical burns or inflammations; etc.

Code 22 - Dust Diseases of the Lungs (Pneumoconioses). Examples: Silicosis, asbestosis, coal worker. s pneumoconiosis, byssinosis, and other pneumoconioses.

Code 23 - Respiratory Conditions Due to Toxic Agents. Examples: Pneumonitis, pharyngitis, rhinitis, or acute congestion due to chemicals, dusts, gases, or fumes; etc.

Code 24 - Poisoning (Systemic Effects of Toxic Materials). Examples: Poisoning by lead, mercury, cadmium, arsenic, or other metals, poisoning by carbon monoxide, hydrogen sulfide, or other gases; poisoning by benzol, carbon tetrachloride, or other organic solvents; poisoning by insecticide sprays such as parathion, lead arsenate; poisoning by other chemicals such as formaldehyde, plastics, and resins; etc.

Code 25 - Disorders Due to Physical Agents (Other than Toxic Materials). Examples: Heatstroke, sunstroke, heat exhaustion and other effects of environmental heat; freezing, frostbite and effects of exposure to low temperatures; caisson disease; effects of ionizing radiation (isotopes, x-rays, radium); effects of nonionizing radiation (welding flash, ultraviolet rays, microwaves, sunburn); etc.

Code 26 - Disorders Associated with Repeated Trauma.

Examples: Noise-induced hearing loss; synovitis, tenosynovitis, and bursitis; Raynaud's phenomena; and other conditions due to repeated motion, vibration, or pressure.

Code 29 - All Other Occupational Illnesses. Examples: Infectious hepatitis, malignant and benign tumors, all forms of cancer, kidney diseases, food poisoning, histoplasmosis; etc.

Item 24. Describe what the employee was doing when he or she became injured or ill.

Items 25, 26, and 27. Show the number of weeks (or years and weeks) of experience of the injured person at the job title (indicated in Item 17), at your operation, and his/her total mining experience.

Section D - RETURN TO DUTY INFORMATION

Section D is to be completed in full when all return-to-duty information is available. If the information is not available within ten working days after a reportable occurrence, then the first two pages are sent to MSHA without Section D being completed; PAGE 3 is then mailed to DSHTC- with full information when the data are available. Until all the items are answered and the report sent to DSHTC-DMIS, the occurrence remains an open case.

Item 28. If the injured person was transferred or terminated as a result of the injury or illness, check the box and answer items 29, 30, and 31.

Item 29. Show the date that the injured person returned to his regular job at full capacity or was transferred or terminated. This date should indicate when the count of days away from work and/or days of restricted work activity have stopped.

Item 30. Show the number of workdays 1/ the injured person did not report to his place of employment, i.e., number of days away from work.

Item 31. Show the number of workdays the injured person was on restricted work activity; do not include days away from work reported in Item 30.

At the bottom of the form, show the name of the person who completed the form; the date the report was prepared; and the telephone number where the person who completed the form may be reached.

1/Note: The number of lost workdays should not include the day of injury or onset of illness, or any days on which the employee was not previously scheduled to work even though able to work, such as holidays or plant closures.

Diagnosis of an "occupational illness or disease" under Part 50 does not automatically mean a disability or impairment for which the miner is eligible for compensation, nor does the Agency intend for an operator's compliance with Part 50 to be equated with an admission of liability for the reported illness or disease. If a chest x-ray for a miner with a history of exposure to silica or other pneumoconiosis-causing dusts is rated at 1/0 or above, utilizing the International Labor Office (ILO) classification system, it is MSHA's policy that such a finding is, for Part 50 reporting, a diagnosis of an occupational illness, in the nature of silicosis or other pneumoconiosis and, consequently, reportable to MSHA.

Mine Accident, Injury and Illness Report

U.S. Department of Labor

Mine Safety and Health Administration

Approved For Use Through 09/30/99 OMB Number 1219-0007

• Section A - Identification Data

MSHA ID Number | Contractor ID | Report Catagory | ☐ Check here if report pertains to contractor

☐ Metal/Nonmetal Mining ☐ Coal Mining

Mine Name | Company Name

• Section B - Complete for Each Reportable Accident Immediately Reported to MSHA

1. Accident Code (circle applicable code - see instructions) 01 - Death 02 - Serious Injury 03 - Entrapment 04 - Inundation 05 - Gas or Dust Ignition 06 - Mine Fire 07 - Explosives 08 - Roof Fall 09 - Outburst 10 - Impounding Dam 11 - Hoisting 12 - Offsite injury

2. Name of Investigator

3. Date Investigation Started (Month / Day / Year)

4. Steps Taken to Prevent Recurrence of Accident

• Section C - Complete for Each Reportable Accident, Injury or Illness

5. Circle the Codes Which Best Describe Where Accident/Injury/Illness Occurred (see instructions)

(a) Surface Location: 02 Surface at Underground Mine 30 Mill, Preparation Plant, etc. 03 Strip/Open Pit Mine 04 Surface Auger Operation 05 Culm Bank/Refuse Pile 06 Dredge Mining 12 Other Surface Mining 17 Independent Shops (with own MSHA ID) 99 Office Facilities

(b) Underground Location: 01 Vertical Shaft 02 Slope/Inclined Shaft 03 Face 04 Intersection 05 Underground Shop/Office 06 Other

(c) Underground Mining Method: 01 Longwall **02 Shortwall** **03 Conventional Stoping** 05 Continuous Mining 06 Hand 07 Caving 06 Other

6. Date of Accident (Month / Day / Year)

7. Time of Accident ☐ am ☐ pm

8. Time Shift Started ☐ am ☐ **pm**

7
8

9. Describe Fully the Conditions Contributing to the Accident/Injury/Illness, and Quantify the Damage or Impairment

10. Equipment Involved | Type | Manufacturer | Model Number

10
MAN

11. Name of Witness to Accident/Injury/Illness

12. Number of Reportable Injuries or Illnesses Resulting from This Occurrence

13. Name of Injured/Ill Employee

14. Sex ☐ **Male** ☐ **Female**

15. Date of Birth (Month / Day / Year)

12
14

16. Last Four Digits of Social Security Number

17. Regular Job Title

☐ 18. Check if this Injury/Illness resulted in death.

☐ 19. Check if Injury/Illness resulted in permanent disability (include amputation, loss of use, & permanent total disability.

16
17
18
19

20. What Directly Inflicted Injury or Illness?

21. Nature of Injury or Illness

20
21

22. Part of Body Injured or Affected

23. Occupational Illness (circle applicable code - see instructions) 21 Occupational Skin Diseases 22 Dust Diseases of the Lungs 23 Respiratory Conditions (toxic agents) 24 Poisoning (toxic Materials) 25 Disorders (physical agents) 26 Disorders (repeated trauma) 29 Other

22
24

24. Employee's Work Activity When Injury or illness Occurred

Experience	Years	Weeks
25. Experience in This Job Title		
26. Experience at This Mine		
27. Total Mining Experience		

• Section D - Return to Duty Information

☐ 28. Permanently Transferred or Terminated (if checked, complete items 29,30, &31)

29. Date Returned to Regular Job at Full Capacity (or item 28) (Month / Day / Year)

Answer 30 & 31 when case is closed

30. Number of Days Away from Work (if none, enter 0)

31. Number of Days Restricted Work Activity (if none, enter 0)

Person Completing Form (name) | Title

Date This Report Prepared (month, Day, year) | Area Code and Telephone Number

MSHA Form 7000-1, July 91 (revised)

For Official Use Only

Degree
Accident Type
Accident Class
Scheduled Charge
Keyword

Mailing Instructions for the MSHA 7000-1

Form 7000-1, Mine Accident, Injury and Illness Report is a four-part, color-coded form. If filing online, copies will be sent electronically to the appropriate offices.

If you are using the form fill option, make four copies of the completed form and mail or fax as follows:

Copy 1: Original (White) should be sent to:

MSHA Office of Injury and Employment Information
P.O. Box 25367
Denver, Colorado 80225

Toll-free fax: (888) 231-5515 (If sending via fax, please use black ink and do not send a copy of the same form via regular mail unless requested to do so.)

Copy 2: Return to Duty Report (Pink) should be sent to above address only after the employee has returned to full duty or been transferred or terminated. Please write Pink at the top and complete Section D - Return to Duty Information.

Note: It is not necessary to send in the Pink copy if Section D is completed on the original 7000-1.

Copy 3: should be sent to your Local MSHA District Office (Yellow)

(If sending via fax, please use black ink and do not send a copy of the same form via regular mail unless requested to do so.)

Note: Please write “Yellow” at the top of this copy

Copy 4: should be retained at the mine (or nearest mine office) for five years.

Contact Information:

Questions regarding this form should be directed to MSHA at (877) 778-6055 or MSHAhelpdesk@dol.gov

Completing Form 7000-2 (Quarterly Employment Data)

For general instructions, electronic filing, or downloading form 7000-2 from the Internet: www.msha.gov/forms/elawsforms/7000-2.htm

Questions about filing the Quarterly Mine Employment and Coal Production Report should be directed to the Office of Injury and Employment Information, Lakewood, Colorado, (303) 231-5453.

You may use MSHA's **Toll Free Fax # - 888-231-5515** to submit your completed forms.
or mail to:

MSHA
PEIR - Office of Injury and Employment Information
P.O. Box 25367
Denver, CO 80225-0367

General Information of Form 7000-2

1. Completed by mine operator or independent contractor working on mine property.
2. Independent contractor only completes one form for all work done on metal/nonmetal mine properties and one for coal properties.
3. Original form submitted to:

   DOL – MSHA – PEIR - OIEI
   P.O. Box 25367
   Denver, Colorado 80225 - 0367

   or fax to 1-888-231-5515
4. Operator retains copy for 5 years.
5. Sand and gravel operations use code 03 or 06 as appropriate, except for data on office workers where code 99 is used.
6. Due dates – 1st quarter by April 15, 2nd quarter by July 15, 3rd quarter by Oct. 15, and 4th quarter by Jan 15.

Completing form 7000-2

1. **Calendar quarters**: 1- Jan-Mar postmarked by Apr 15, 2- Apr-June postmarked by July 15, 3 - July-Sept postmarked by Oct 15, and 4 - Oct-Dec postmarked by Jan 15.
2. **MSHA I.D. Number** 7-digit number assigned by MSHA to the mine operation and, when applicable, the 3-digit number assigned to an independent contractor. Direct questions to MSHA District office.
3. **County** – name of county, borough, or independent city in which operation is located. Independent contractors can work in various counties.
4. **Operation name** is specific name of mine or plant to which MSHA I.D. number was assigned and for which the report is being submitted. Independent contractors' operation name refers to all the mining operations at which the contractor worked. Independent contractor data can be combined with the mine operator's data.

5. **Company Name** is the name of the operating company to which the submitted report pertains. IC would list his company's name here unless his information is included in the mine operator's report.

6. **Mailing Address** is the address of the mine office where the quarterly employment report is to be retained. IC would list his own mailing address here unless his information is included in the mine operator's report.

7. **Persons working, Employee Hours, and Coal Production** –

Note!

Report each person only once.

Average number of employees – Add no. of employees working during each pay period, divide by the number of pay periods and **round off to nearest whole number**.

Total employee-hours worked during quarter – Actual hours employees on duty (exclude time off, even if it is paid leave). Report each overtime hour as 1 hour, not 1.5 hours.

Production of clean coal – For coal mine use only.

Other Reportable Data – Put in number of reportable injuries during the quarter – MSHA crosschecks this number by computer with your form 7000-1.

Quarterly Mine Employment and Coal Production Report

(SEE INSTRUCTIONS ON REVERSE SIDE OF COPY 2)

DOL - MSHA - PEIR - OIEI
P.O. Box 25367
Denver, Colorado 80225 - 0367

Date Report Completed
Mo. Day Yr.

For Quarter Year

Mail Before

Check here if this report is being submitted by a contractor ☐

If any information below is incorrect, please enter correct information here:

County:

Operation Name:

Operating Company Name and Mailing Address:

County

MSHA ID Number Contractor ID

Operation Name

Operating Company Name and Mailing Address

1. Persons Working, Employee-Hours, and Coal Production

(1) Operation Sub Unit Code(s) previously reported:		Code	(2) Average number of persons working during quarter	(3) Total employee hours worked during the quarter	(4) Production of clean coal during quarter, (short tons)
Underground Mine	Underground	01			
	Surface Shops, Yards, etc.	02			
Surface Mine (including associated shops and yards)	Strip, Open Pit, or Quarry	03			
	Auger (Coal Mine Only)	04			
	Culm Bank or Refuse Pile (Coal Mine Only)	05			
	Dredge	06			
	Other Surface Mining (Metal/Nonmetal Only)	12			
Independent Shops or Yards		17			
Mill Operations, Preparation Plants, or Breakers (include associated shops and yards)		30			
Office (professional and clerical employees at the mine or plant working in an office)		99			

2. Other Reportable Data

How many MSHA reportable injuries or illnesses did you have this quarter?

Person to be contacted regarding this report: Name

Title

Tel. No. ( ) -
area code

MSHA Form 7000-2, July 97, (revised) OMB Number 1219-0006; Approval Expires September 30, 1999

Copy 1 - Return to MSHA (Denver)

Section 9
Hazard Communication

Action Items

1. Prepare your written HazCom Program -- Use the generic Program and checklist in this Section.
2. Prepare your chemical list.
3. Collect and collate Material Safety Data Sheets (MSDS) for chemicals on your list and put them in notebooks. Obtain container labels.
4. Determine the chemicals each worker is exposed to.
5. Train workers on chemical hazards they are exposed to (Read your written program to them and also read the MSDS sections on the chemicals' hazards and controls/protective measures).
6. Provide other operators and contractors information on the properties of your hazardous chemicals.
7. Select an MSDS for the product(s) you produce. See sample MSDS for product containing silica and one for limestone in this Section.
8. Label your product (See Crystalline Silica Label in this Section) and all hazardous chemicals on your mine site – see labeling instructions in checklist for Written HazCom Program).
9. Make a hazardous chemical information sheet for any contractors you hire to work on the mine site.
10. Make and place signs throughout the mine property restricting visitors from entering areas where they would be exposed to hazardous chemicals.
11. Modify your training plans to incorporate HazCom. You may simply attach a copy of the appropriate modification included near the end of this section.

Contents of This Section

Test Your Knowledge of MSHA's HazCom Rule (answers on bottom of page)

1. The HazCom standard restricts chemical use, requires controls and sets exposure limits? T___, F___.
2. The HazCom standard is an information and training standard to reduce chemically related injuries and illnesses T___, F___.
3. You must keep MSDSs for each hazardous chemical at your mine T___, F___.
4. You need not establish a written HazCom program T___, F___.
5. Your miners need to be trained about your HazCom program and about the hazards and protective measures for any new hazardous chemicals they will be exposed to T___, F___.
6. Training is required annually T___, F___.
7. The HazCom standard requires that you have MSDSs for chemicals that are either a physical or health hazard T___, F___.
8. The HazCom standard doesn't require that your MSDSs be kept in a location where workers can access them readily T___, F___.
9. No consumer products need to be included in your Hazardous Chemical List T___, F___.
10. No articles need to be included in your Hazardous Chemical List T___, F___.
11. Personal items (food, tobacco, drugs, cosmetics etc.) packaged for retail sale and intended for personal use need not be included in your hazardous chemical list T___, F___.
12. Biological and radiation hazards need not be included in your hazardous chemical list T___, F___.
13. Wood or wood products, typically, need not be included in your hazardous chemical list T___, F___.
14. MSHA has sample written HazCom programs on the Internet at www.msha.gov T___, F___.
15. Missing or defaced labels on hazardous chemicals must be replaced immediately T___, F___.
16. A mine operator is not responsible for an inaccurate label supplied by a manufacturer T___, F___.
17. Most mine products contain respirable crystalline quartz and this requires that the mine prepare an MSDS and warning label T___, F___.
18. The date the standard was enforced is September 23, 2002 for mines with 6 or more miners and March 21, 2003 for mines with 5 or fewer miners T___, F___.
19. An unlabeled temporary, portable container must be empty at the end of the shift T___, F___.
20. The mine operator must make all written HazCom materials available to miners and designated representatives T___, F___.
21. The mine must pay for only the first copy of HazCom materials provided to miners T___, F___.
22. Training must include providing information on location of HazCom materials at the mine, location of hazardous chemicals at the mine, how to tell if a chemical is present, protective measures, and how the operator protects the miner T___, F___.
23. HazCom is currently covered under Part 47 of 30 CFR T___, F___.

Answers – (1) F (2) T (3) T (4) F (5) T (6) F (7) T (8) F (9) F (10) F (11) T (12) T (13) T (14) T (15) T (16) T (17) T (18) T (19) T (20) T (21) T (22) T (23) T

Subsection A. GENERIC HAZCOM PROGRAM

Note -- If you want to understand more about the HazCom standard, go to the interactive program at http://www.msha.gov/Hazcom/Buttons/index.htm.

Contents of This Subsection:

1. A generic fill-in-the-blank HazCom Program is presented on pages 5-7. This program was found on MSHA's web site. Fill in the blanks and you will have a written HazCom Program.
2. A checklist on pages 8 and 9 for you to use to help make sure that you are doing the things the HazCom standard requires.
3. A warning label for a product containing "Crystalline Silica" on page 10. If you have a mine product, you will need such a label.
4. An MSDS for a Sand and Gravel Product on pages 11-16. If you are mining sand and gravel, you may be able to use this one by simply filling in the company information requested.
5. An MSDS for a Limestone Product on pages 17-22. If you are mining limestone, you may be able to use this one by simply filling in the company information requested.

Note that you should be able to do the initial training yourself. This might consist of: 1) reading your written program to all employees and 2) for each hazardous chemical they may possibly be exposed to, reading the information on the label and (or) MSDS about it's hazards and about how employees can protect themselves from these hazards. Keep a written record of this training (such as a Part 46 Task Training Certificate) on site including, for each subject: 1) the time spent (i.e. 15 minutes), 2) the training method (i.e. lecture, discussion), 3) coarse materials (i.e. written program, MSDSs, labels), and 4) the evaluation method (i.e. oral feedback).

HAZARD COMMUNICATION PROGRAM

Mine Name: _____
ID No.: _____

47.32(a)(1) HAZARD DETERMINATION

Each chemical brought on mine property and each chemical produced on mine property will be evaluated to determine if it is hazardous.

47.32 (a)(2) LABELS AND OTHER FORMS OF WARNING

The labeling system at this time is:

☐ Manufacturers' Labels
☐ Other_____
[Describe any in-house system, such as use of special numbers or graphics].

47.32 (a)(3) MATERIAL SAFETY DATA SHEETS (MSDS)

This program includes a **current, legible, and accessible** Material Safety Data Sheet (MSDS) for each hazardous chemical at this mine site.

☐ Manufacturers' MSDS
☐ Other _____

MSDS's will be accessible to miners during each work shift for each hazardous chemical to which they may be exposed either:

☐ At each work area where the hazardous chemical is produced or used
☐ At an alternative location (_____), provided that the MSDS is readily available to miners in an emergency.

47.32(a)(4) MINER TRAINING

All miners will receive instruction about the physical and health hazards of chemicals in their work areas, the protective measures they can take against these hazards (personal protective equipment, ventilation, warning signs, etc.), and the contents of the mine's HazCom Program (47.2).

NOTE: 30 CFR, Parts 46 & 48, have been amended to include HazCom Training Requirements

47.32(c)(1)(2) TRAINING FOR OTHER OPERATORS

Other operators at this mine will be provided with access to MSDS's and informed about hazardous chemicals to which their miners can be exposed, the labeling system on the

containers of these chemicals, and appropriate protective measures.

47.32(b)(1,2) LIST OF HAZARDOUS CHEMICALS

This is a current list of all hazardous chemicals known to be at this mine, including hazardous chemical waste.

Each hazardous chemical on this property will be clearly identified in exactly the same way on the list, its container label, and its corresponding MSDS.

No.	Chemical/Common/Trade Name	Mine or Work Area

No.	Chemical/Common/Trade Name	Mine or Work Area

HAZCOM PROGRAM CHECKLIST

Note – It is recommended that you attach this checklist to your Written HazCom Program!

1. ☐ Is chemical list current? Is a copy available with this Program and with each MSDS file?
2. ☐ Are copies of the MSDS available for every hazardous chemical brought onto the mine site?
3. ☐ Are MSDSs immediately available to workers (for chemicals they may be exposed to)?
4. ☐ Are all potentially exposed miners on all workshifts aware of where and how to immediately access MSDSs?
5. ☐ Are the same chemical names used on labels, on MSDSs and on your chemical list?
6. ☐ Do all hazardous chemical containers have a clearly readable label?
7. ☐ Are all temporary portable containers labeled if they are not emptied by the end of the shift?
8. ☐ Are all bulk storage containers of hazardous chemicals labeled (for example -- diesel fuel or gasoline)?
9. ☐ Are all stationary process containers identified by a label or alternative means which: a) clearly identifies the container to which it applies, b) contains the required hazard warning information, and c) is immediately available to miners in the work area.
10. ☐ Does each container of hazardous chemical produced at the mine have an up-to-date container label? (Crystalline Silica Warning Label on back of weight ticket is OK)
11. ☐ Is a single system (such as HMIS System sold by Label Master) available for making labels you are required to make? Are all affected persons trained on the system?
12. ☐ Are all employees trained on the following: a) the physical and health hazards of chemicals in each miner's work area; b) Protective measures a miner can take against these hazards; and c) the contents of the company's HazCom program and where miners can gain access to it.
13. ☐ Is HazCom training for specific chemical hazards associated with new or non-routine tasks given before beginning the task?
14. ☐ Are all contractors and (or) other operators informed verbally and (or) in writing about 1) hazardous chemicals to which their employees may be exposed while on the mine site, 2)

the labeling system used for the chemicals of concern, and 3) appropriate protective measures?

15. ☐ Is HazCom training recorded properly on your new miner, new experienced miner, task and annual refresher training certificates (for Part 48 training check "other" box and write-in "Initial HazCom Training", for Part 46 add subject "Initial HazCom Training").

16. ☐ Does your training plan contain the HazCom Addendum?

17. ☐ Do potentially exposed miners and their representatives have information on mine hazardous wastes that (1) identifies the hazardous chemical components, (2) describes physical or health hazards, and (c) specifies appropriate protective measures?

18. ☐ Are alternative labeling methods being used for hazardous chemicals not in containers (signs, etc. for piles, holding ponds etc.)?

19. ☐ Have arrangements been made for providing, upon request, one free copy of labeling information, MSDSs, the mines HazCom program, list of hazardous chemicals and any other HazCom program documents to miners, miner's representatives or contractor? Has a fair (per page) charge been set to be paid by all who request additional copies?

20. ☐ Have arrangements been made to provide customers, who request them, with one free copy of the MSDS and the chemical's label (as well as any updates) for any hazardous chemical supplied by the mine? Has a fair, per-page charge been set for all who request additional copies? ***Note*** *-- see attached warning label and MSDSs for sand and gravel and limestone products containing crystalline silica*.

21. ☐ Are visitors informed of hazardous chemicals and how to protect themselves or are signs posted which restrict visitors from areas containing hazardous chemicals?

Note -- For more details on various exemptions and procedures, see the HazCom Standard (30CFR Part 47) or obtain a copy of the June 21, 2002 Federal Register (standard is near the end).

Crystalline Silica Warning Label

Note – Almost all mined products contain crystalline silica. For this reason, you will need some sort of warning label on your product. The generic form below is one possible alternative. You will need to fill in the information requested.

For bulk sales, this or other label may be printed on the back side of the batch ticket or given to the customer as a separate sheet attached to the batch ticket.

Product Name:_____

CRYSTALLINE SILICA WARNING

CONTENTS:	This product contains crystalline silica. As sold, this product does NOT contain respirable crystalline silica. Some handling methods, however, may abrade the material and produce respirable dust.
CONTROLS:	Use exhaust ventilation and a high efficiency particulate (HEPA) filter dust respirator when handing this material in a way that abrades the product and produces respirable dust. Take precautions to prevent the production of respirable dust.
EFFECTS:	Breathing excessive amounts of respirable crystalline silica over a period of time can cause a disabling lung disease. The International Agency for Research on Cancer (IARC) has determined that respirable crystalline silica is a human carcinogen.
CONTACT(S) FOR ANSWERS TO SAFETY/ HEALTH QUESTIONS:	Company Name _____ Company Address _____ Company Phone No. _____ Contact Person _____ Phone No. _____

MSDS FOR SAND & GRAVEL PRODUCT

Material Safety Data Sheet
(Natural Sand or Gravel)

1. IDENTIFICATION

Chemical Name:	Natural Sand or Gravel	Chemical Formula:	N/A
Trade Name:	Sand or Gravel	Molecular Weight:	N/A
Synonyms:	Construction Aggregate	DOT Identification No:	None

2. PRODUCT AND COMPONENT DATA

Component(s) Chemical Name	CAS Registry No.	% (Approx)	Exposure Limits
Natural Sand* or Gravel*	None	100	See section 6
*Composition varies naturally – typically contains quartz (crystalline silica).	14808-60-7	>1	

3. PHYSICAL DATA

Appearance and odor:	Angular or round multicolored particles. No odor.
Specific Gravity:	2.55 – 2.80
Boiling point (At 1 Atm.):	N/A
Vapor Density in Air (Air = 1):	N/A
Vapor Pressure (mmHg @ 20 ^{o}C):	0
% Volatile, By Volume:	0%
Evaporation Rate (at 1Atm, and 25 ^{o}C; n-butyl acetate = 1):	0
Solubility in Water:	Negligible

4. REACTIVITY DATA

Stability: Stable

Conditions to Avoid: Avoid contact with incompatible materials (see below).

Incompatibility (materials to avoid): Contact with powerful oxidizing agents such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride, and oxygen difluoride may cause fire and/or explosion. Silica dissolves readily in hydrofluoric acid producing a corrosive gas – silicon tetrafluoride.

Hazardous Decomposition Products: Silica-containing respirable dust particles may be generated by handling.

Hazardous Polymerization: Not known to polymerize

5. FIRE AND EXPLOSION HAZARD DATA

Flashpoint (Method used): Not flammable

Flammable Limits in Air: Not Flammable

Extinguishing Agents: None required

Unusual Fire and Explosion Hazards: Contact with powerful oxidizing agents may cause fire and/or explosions (see section 4 of this MSDS).

MSDS FOR SAND & GRAVEL PRODUCT CONTINUED

6. TOXICITY AND FIRST AID

EXPOSURE LIMITS (When exposure to this product and other chemicals is concurrent, the exposure limit must be defined in the workplace.) Unless specified otherwise, limits are expressed as eight-hour time-weighted aver ages (TWA).

ABBREVIATIONS: TLV = threshold limit value of the American Conference of Governmental Industrial Hygienists (ACGIH); MSHA PEL = permissible exposure limit of the Mine Safety and Health Administration (MSHA); OSHA PEL= permissible exposure limit of the Occupational Safety and Health Administration (OSHA); mg/m^3 = milligrams of substance per cubic meter of air.

Respirable Crystalline Silica:

2001 TWA TLV = 0.05 mg/m^3 for quartz, tridymite or cristobalite, 0.1 mg/m^3 for tripoli

MSHA and OSHA TWA PEL* (based on 1973 TWA TLV) for respirable particulate containing crystalline silica = 10 mg/m^3 / (%SiO2 + 2); This limits the TWA of the crystalline silica content to approximately 0.1 mg/m^3.

* Divide calculated MSHA and OSHA PEL limits for quartz by 2 to obtain limits for crystalline silica in the form of tridymite or cristobalite.

Other Particulates:

Respirable particulate not otherwise classified (no asbestos & < 1% crystalline silica);

2001 TWA TLV = 3 mg/m^3,

OSHA (& MSHA) PEL = 5 mg/m^3 – this is also equal to the value obtained using the 1973 TLVs formula above for respirable dust containing crystalline quartz -- 10/(%SiO_2+2), which, when the % SiO_2 is equal to 0.00, 10/(0.00 + 2), equals 5 mg/m^3.

Total particulate not otherwise classified (no asbestos & < 1% crystalline silica) --

2001 TWA TLV = 10 mg/m^3
MSHA PEL = 30 mg/m^3 / (% quartz + 3);
OSHA PEL = 30 mg/m^3 / (% quartz + 2)

ACGIH. MSHA, and OSHA have determined that adverse effects are not likely to occur in the workplace provided exposure levels do not exceed the appropriate TLVs/PELs. However, because of the wide variation in individual susceptibility, lower exposure limits may be

MSDS FOR SAND & GRAVEL PRODUCT CONTINUED

appropriate for some individuals including persons with pre-existing medical conditions such as those described below.

Medical Conditions Aggravated By Exposure
Inhaling respirable dust and/or crystalline silica may aggravate existing respiratory system disease(s) and/or dysfunctions. Exposure to dust may aggravate existing skin and/or eye conditions.

Primary Route(s) of Exposure: X Inhalation __Skin __Ingestion

Acute Toxicity
EYE CONTACT: Direct contact with dust may cause irritation by mechanical abrasion.

SKIN CONTACT: Direct contact may cause irritation by mechanical abrasion.

SKIN ABSORPTION: Not expected to be a significant exposure route.

INGESTION: Expected to be practically non-toxic. Ingestion of large amounts may cause gastrointestinal irritation and blockage.

INHALATION: Dusts may irritate the nose, throat, and respiratory tract by mechanical abrasion. Coughing, sneezing, and shortness of breath may occur following exposures in excess of appropriate exposure limits.

Use of natural sand and gravel for construction purposes is not believed to cause additional acute toxic effects. However, repeated overexposures to very high levels of respirable crystalline silica (quartz, cristobalite, tridymite) for periods as short as six months have caused acute silicosis. Acute silicosis is a rapidly progressive, incurable lung disease that is typically fatal. Symptoms include (but are not limited to): shortness of breath, cough, fever, weight loss, and chest pain.

First Aid
EYES: Immediately flush eye(s) with plenty of clean water for at least 15 minutes, while holding the eyelid(s) open. Occasionally lift the eyelid(s) to ensure thorough rinsing. Beyond flushing, do not attempt to remove material from the eye(s). Contact a physician if irritation persists or later develops.

SKIN: Wash with soap and water. Contact a physician if irritation persists or later develops.

INGESTION: If person is conscious, give large quantity of water and induce vomiting; however, never attempt to make an unconscious person drink or vomit. Get immediate medical attention.

INHALATION: Remove to fresh air. Dust in throat and nasal passages should clear spontaneously. Contact a physician if irritation persists or later develops.

MSDS FOR SAND & GRAVEL PRODUCT CONTINUED

For emergencies, contact _____

Chronic Toxicity

Prolonged and repeated inhalation of respirable crystalline silica-containing dust in excess of appropriate exposure limits has caused silicosis, a lung disease. Not all individuals with silicosis will exhibit symptoms (signs) of the disease. However, silicosis can be progressive, and symptoms can appear at any time, even years after exposure has ceased. Symptoms of silicosis may include, but are not limited to, the following: shortness of breath; difficulty breathing with or without exertion; coughing; diminished work capacity; diminished chest expansion; reduction of lung volume; right heart enlargement and/or failure. Smoking may increase the risk of developing lung disorders, including emphysema and lung cancer. Persons with silicosis have an increased risk of pulmonary tuberculosis infection.

Respirable dust containing newly broken silica particles has been shown to be more hazardous to animals in laboratory tests than respirable dust containing older silica particles of similar size. Respirable silica particles which had aged for sixty days or more showed less lung injury in animals than equal exposures of respirable dust containing newly broken particles of silica.

There are reports in the literature suggesting that excessive crystalline silica exposure may be associated with adverse health effects involving the kidney, scleroderma (thickening of the skin caused by swelling and thickening of fibrous tissue) and other autoimmune disorders. However, this evidence has been obtained primarily from case reports involving individuals working in high exposure situations or those who have already developed silicosis; and therefore, this evidence does not conclusively prove a causal relationship between silica or silicosis and these adverse health effects. Several studies of persons with silicosis also indicate an increased risk of developing lung cancer, a risk that increases with the duration of exposure. Many of these studies of silicotics do not account for lung cancer confounders, especially smoking.

Sand or gravel is not listed as a carcinogen by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), or the Occupational Safety and Health Administration (OSHA). In October 1996, an IARC Working Group re-assessing crystalline silica, a component of this product, designated respirable crystalline silica as carcinogenic (Group 1). The NTP'S Report on Carcinogens, 9th edition, lists respirable crystalline silica as a "known human carcinogen." In year 2000, the American Conference of Governmental Industrial Hygienists (ACGIH) listed respirable crystalline silica (quartz) as a suspected human carcinogen (A-2). These classifications are based on sufficient evidence of carcinogenicity in certain experimental animals and on selected epidemiological studies of workers exposed to crystalline silica.

7. PERSONAL PROTECTION AND CONTROLS

Respiratory Protection For respirable quartz levels that exceed or are likely to exceed an 8-hr TWA of 0.1 mg/m^3, a NIOSH approved dust respirator must be worn. For respirable quartz levels that exceed or are likely to exceed an 8-hr TWA of 0.5 mg/m^3, a NIOSH approved HEPA filter respirator must be

MSDS FOR SAND & GRAVEL PRODUCT CONTINUED

worn. If respirable quartz levels exceed or are likely to exceed an 8-hr TWA of 5 mg/m^3, a NIOSH approved positive pressure, full-face respirator or equivalent is required. Respirator use must comply with applicable MSHA or OSHA standards, which include provisions for a user training program, respirator repair and cleaning, respirator fit testing, and other requirements.

Ventilation
Local exhaust or general ventilation adequate to maintain exposures below appropriate exposure limits.

Skin Protection
See "Hygiene" section below.

Eye Protection
Safety glasses with side shields should be worn as minimum protection. Dust goggles should be worn when excessively (visible) dusty conditions are present or are anticipated.

Hygiene
Wash dust-exposed skin with soap and water before eating, drinking, smoking, and using toilet facilities. Wash work clothes after each use.

Other Control Measures
Respirable dust and quartz levels should be monitored regularly. Dust and quartz levels in excess of appropriate exposure limits should be reduced by all feasible engineering controls, including (but not limited to) wet suppression, ventilation, process enclosure, and enclosed employee work stations that are well-ventilated with clean air.

8. STORAGE AND HANDLING PRECAUTIONS

This product is not intended or designed for use as an abrasive blasting medium or for foundry applications, and should not be used for these purposes.

Follow the personal protection and controls set forth in Section 7 of this MSDS when handling this product. Respirable crystalline silica-containing dust may be generated during processing, handling, and storage.

9. SPILL, LEAK AND DISPOSAL PRACTICES

Steps to be Taken in Case Material is Released or Spilled
The personal protection and controls identified in Section 7 of the MSDS should be used as appropriate. Spilled material, where dust can be generated, may overexpose cleanup personnel to respirable crystalline silica-containing dust. Wetting of spilled material and/or use of respiratory protective equipment may be necessary. Do not dry-sweep spilled material.

Prevent spilled materials from inadvertently entering streams, drains, or sewers.

For emergencies, contact _____

MSDS FOR SAND & GRAVEL PRODUCT CONTINUED

Waste Disposal Method
Pick up and reuse clean materials. Dispose of waste materials only in accordance with applicable federal, state, and local laws and regulations.

10. TRANSPORTATION

DOT Hazard Classification: None **Placard Required**: None **Label Required**: Label as required by the OSHA Hazard Communication Standard [29 CFR 1910.1200 (f) and applicable state and local laws and regulations. See label in Appendix C

For Further Information Contact: Name _____, Phone No. _____
Address_____
_.

Date of Preparation:
_____

Emergency Information: Name_____, Phone No. _____, Email _____.

Notice: _____ believes the information contained herein is accurate; however, _____ makes no guarantees with respect to such accuracy and assumes no liability in connection with the use of the information contained herein by any party. The provision of the information contained herein is not intended to be and should not be construed as legal advice or as ensuring compliance with any federal, state or local laws and regulations. Any party using this product should review all such laws, rules or regulations prior to use.
NO WARRANTY IS MADE, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE.

MSDS FOR LIMESTONE PRODUCT

Material Safety Data Sheet
(Limestone)

1. IDENTIFICATION

Chemical Name: Limestone Chemical Formula: N/A
Molecular Weight: N/A Trade Name: Crushed Stone
DOT Identification No: None

Synonyms: Aggregate, Aglime, Barn Lime, Coverstone, Flexible Base, Fluxing Agent, Manufactured Sand, Mineral Filler, Screenings

2. PRODUCT AND COMPONENT DATA

Component(s) Chemical Name	CAS Registry No.	% (Approx)	Exposure Limits
Limestone*	1317-65-3	100	See section 6
*Composition varies naturally – typically contains quartz (crystalline silica).	14808-60-7	>1	

3. PHYSICAL DATA

Appearance and odor:	Angular gray, white and tan particles ranging in size from powder to boulders. No odor.
Specific Gravity:	2.6 – 2.75
Boiling point (At 1 Atm.):	N/A
Vapor Density in Air (Air = 1):	N/A
Vapor Pressure (mmHg @ 20 ^{o}C):	N/A
% Volatile, By Volume (@ 100 ^{o}F):	0%
Evaporation Rate (at 1 Atm. and 25EC; n-butyl acetate = 1):	0
Solubility in Water:	0

4. REACTIVITY DATA

Stability: Stable

Conditions to Avoid: Avoid contact with incompatible materials (see below).

Incompatibility (materials to avoid): Contact with powerful oxidizing agents such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride, and oxygen difluoride may cause fire and/or explosions. Silica dissolves readily in hydrofluoric acid producing a corrosive gas – silicon tetrafluoride.

Hazardous Decomposition Products: Limestone ignites on contact with fluorine and is incompatible with acids, alum, ammonium salts, and magnesium. Silica reacts violently with powerful oxidizing agents such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride, and oxygen difluoride yielding possible fire and/or explosions. Silica dissolves readily in hydrofluoric acid producing a corrosive gas – silicon tetrafluoride.

Hazardous Polymerization: Not known to polymerize

MSDS FOR LIMESTONE PRODUCT CONTINUED

5. FIRE AND EXPLOSION HAZARD DATA

Flashpoint (Method used): Not Flammable
Flammable Limits in Air: Not Flammable
Extinguishing Agents: None Required
Unusual Fire and Explosion Hazards: Contact with powerful oxidizing agents may cause fire and/or explosions (see section 4 of this MSDS).

6. TOXICITY AND FIRST AID

EXPOSURE LIMITS (When exposure to this product and other chemicals is concurrent, the exposure limit must be defined in the workplace.) Unless specified otherwise, limits are expressed as eight-hour time-weighted averages (TWA).

ABBREVIATIONS: TLV = threshold limit value of the American Conference of Governmental Industrial Hygienists (ACGIH); MSHA PEL = permissible exposure limit of the Mine Safety and Health Administration

Respirable Crystalline Silica:

2001 TWA TLV = 0.05 mg/m^3 for quartz, tridymite or cristobalite, 0.1 mg/m^3 for tripoli

MSHA and OSHA TWA PEL* (based on 1973 TWA TLV) for respirable particulate containing crystalline silica = 10 mg/m^3 / (%SiO2 + 2); This limits the TWA of the crystalline silica content to approximately 0.1 mg/m^3.

* Divide calculated MSHA and OSHA PEL limits for quartz by 2 to obtain limits for crystalline silica in the form of tridymite or cristobalite.

Other Particulates Including Limestone:

Respirable particulate not otherwise classified (no asbestos & < 1% crystalline silica);

2001 TWA TLV = 3 mg/m^3,

OSHA (& MSHA) PEL = 5 mg/m^3 – this is also equal to the value obtained using the 1973 TLVs formula above for respirable dust containing crystalline quartz -- $10/(\%SiO_2+2)$, which, when the % SiO_2 is equal to 0.00, 10/(0.00 + 2), equals 5 mg/m^3.

Total particulate not otherwise classified (no asbestos & < 1% crystalline silica) --

2001 TWA TLV = 10 mg/m^3

MSDS FOR LIMESTONE PRODUCT CONTINUED

MSHA PEL = 30 mg/m^3 / (% quartz + 3);

OSHA PEL = 30 mg/m^3 / (% quartz + 2)

ACGIH, MSHA, and OSHA have determined that adverse effects are not likely to occur in the workplace provided exposure levels do not exceed the appropriate TLVs/PELs. However, because of the wide variation in individual susceptibility, lower exposure limits may be appropriate for some individuals including persons with pre-existing medical conditions such as those described below.

Medical Conditions Aggravated by Exposure

Inhaling respirable dust and/or crystalline silica may aggravate existing respiratory system disease(s) and/or dysfunctions. Exposure to dust may aggravate existing skin and/or eye conditions.

Primary Route(s) of Exposure: X Inhalation __Skin __Ingestion

Acute Toxicity

EYE CONTACT: Direct contact with dust may cause irritation by mechanical abrasion.
SKIN CONTACT: Direct contact may cause irritation by mechanical abrasion. SKIN ABSORPTION: Not expected to be a significant exposure route. INGESTION: Expected to be practically non-toxic. Ingestion of large amounts may cause gastrointestinal irritation and blockage.
INHALATION: Dusts may irritate the nose, throat, and respiratory tract by mechanical abrasion. Coughing, sneezing, and shortness of breath may occur following exposures in excess of appropriate exposure limits.

First Aid

EYES: Immediately flush eye(s) with plenty of clean water for at least 15 minutes, while holding the eyelid(s) open. Occasionally lift the eyelid(s) to ensure thorough rinsing. Beyond flushing, do not attempt to remove material from the eye(s). Contact a physician if irritation persists or later develops.

SKIN: Wash with soap and water. Contact a physician if irritation persists or later develops.

INGESTION: If person is conscious, give large quantity of water and induce vomiting; however, never attempt to make an unconscious person drink or vomit. Get immediate medical attention.

INHALATION: Remove to fresh air. Dust in throat and nasal passages should clear spontaneously. Contact a physician if irritation persists or later develops.

For emergencies, contact _____

Chronic Toxicity

Prolonged and repeated inhalation of respirable crystalline silica-containing dust in excess of appropriate exposure limits has caused silicosis, a lung disease. Not all individuals with silicosis will

MSDS FOR LIMESTONE PRODUCT CONTINUED

exhibit symptoms (signs) of the disease. However, silicosis can be progressive, and symptoms can appear at any time, even years after exposure has ceased. Symptoms of silicosis may include, but are not limited to, the following: shortness of breath; difficulty breathing with or without exertion; coughing; diminished work capacity; diminished chest expansion; reduction of lung volume; right heart enlargement and/or failure. Smoking may increase the risk of developing lung disorders, including emphysema and lung cancer. Persons with silicosis have an increased risk of pulmonary tuberculosis infection.

Respirable dust containing newly broken silica particles has been shown to be more hazardous to animals in laboratory tests than respirable dust containing older silica particles of similar size.

Respirable silica particles which had aged for sixty days or more showed less lung injury in animals than equal exposures of respirable dust containing newly broken particles of silica.

There are reports in the literature suggesting that excessive crystalline silica exposure may be associated with adverse health effects involving the kidney, scleroderma (thickening of the skin caused by swelling and thickening of fibrous tissue) and other autoimmune disorders. However, this evidence has been obtained primarily from case reports involving individuals working in high exposure situations or those who have already developed silicosis; and therefore, this evidence does not conclusively prove a causal relationship between silica or silicosis and these adverse health effects. Several studies of persons with silicosis also indicate an increased risk of developing lung cancer, a risk that increases with the duration of exposure. Many of these studies of silicotics do not account for lung cancer confounders, especially smoking.

Limestone is not listed as a carcinogen by the International Agency for Research on Cancer (IARC),the National Toxicology Program (NTP), or the Occupational Safety and Health Administration (OSHA). In October 1996, an IARC Working Group re-assessing crystalline silica, a component of this product, designated respirable crystalline silica as carcinogenic (Group 1). The NTP's Report on Carcinogens, 9th edition, lists respirable crystalline silica as a "known human carcinogen." In year 2000, the American Conference of Governmental Industrial Hygienists (ACGIH) listed respirable crystalline silica (quartz) as a suspected human carcinogen (A-2). These classifications are based on sufficient evidence of carcinogenicity in certain experimental animals and on selected epidemiological studies of workers exposed to crystalline silica.

California Proposition 65: WARNING: This product contains chemical(s) known to the state of California to cause cancer.

7. PERSONAL PROTECTION AND CONTROLS

Respiratory Protection

For respirable quartz levels that exceed or are likely to exceed an 8-hr TWA of 0.1 mg/m^3, a NIOSH approved dust respirator must be worn. For respirable quartz levels that exceed or are likely to exceed an 8-hr TWA of 0.5 mg/m^3, a NIOSH approved HEPA filter respirator must be worn. If respirable quartz levels exceed or are likely to exceed an 8-hr TWA of 5 mg/m^3, a NIOSH approved positive pressure, full-face respirator or equivalent is required. Respirator use must comply with

MSDS FOR LIMESTONE PRODUCT CONTINUED

applicable MSHA or OSHA standards, which include provisions for a user training program, respirator repair and cleaning, respirator fit testing, and other requirements.

Ventilation: Local exhaust or general ventilation adequate to maintain exposures below appropriate exposure limits.

Skin Protection
See "Hygiene" section below.

Eye Protection
Safety glasses with side shields should be worn as minimum protection. Dust goggles should be worn when excessively (visible) dusty conditions are present or are anticipated.

Hygiene
Wash dust-exposed skin with soap and water before eating, drinking, smoking, and using toilet facilities. Wash work clothes after each use.

Other Control Measures
Respirable dust and quartz levels should be monitored regularly. Dust and quartz levels in excess of appropriate exposure limits should be reduced by all feasible engineering controls, including (but not limited to) wet suppression, ventilation, process enclosure, and enclosed employee work stations.

8. STORAGE AND HANDLING PRECAUTIONS

Respirable crystalline silica-containing dust may be generated during processing, handling, and storage. The personal protection and controls identified in Section 7 of the MSDS should be used as appropriate. Do not store near food and beverages or smoking material.

9. SPILL, LEAK AND DISPOSAL PRACTICES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
The personal protection and controls identified in Section 7 of the MSDS should be used as appropriate. Spilled material, where dust can be generated, may overexpose cleanup personnel to respirable crystalline silica-containing dust. Wetting of spilled material and/or use of respiratory protective equipment may be necessary. Do not dry-sweep spilled material. Prevent spilled materials from inadvertently entering streams, drains, or sewers.

For emergencies, contact _____

WASTE DISPOSAL METHOD

Pick up and reuse clean materials. Dispose of waste materials only in accordance with applicable federal, state, and local laws and regulations.

10. TRANSPORTATION

DOT Hazard Classification: None

MSDS FOR LIMESTONE PRODUCT CONTINUED

Placard Required: None

Label Required: Label as required by the OSHA Hazard Communication Standard [29 CFR 1910.1200 (f) and applicable state and local laws and regulations. See label in Appendix C.

For Further Information Contact: Name _____, Phone No. _____
Address_____.

Date of Preparation: _____

Emergency Information: Name_____, Phone No. _____, email _____.

Notice: _____ believes the information contained herein is accurate; however, _____ makes no guarantees with respect to such accuracy and assumes no liability in connection with the use of the information contained herein by any party. The provision of the information contained herein is not intended to be and should not be construed as legal advice or as ensuring compliance with any federal, state or local laws and regulations. Any party using this product should review all such laws, rules or regulations prior to use.
NO WARRANTY IS MADE, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE.

"Typical Small Mine Chemical List"

Mine HazCom Number	Chemical/Common Trade Name	Use Location
1	Diesel fuel off-highway	Fueling area
2	Diesel fuel on-highway	Fueling area
3	Gasoline	Fueling area
4	10W30 motor oil	Maintenance shop
5	10W40 motor oil	Maintenance shop
6	Exolube 9 (Heavy Gear Lube)	Maintenance shop
7	Exolube 3 (Light Gear Lube)	Maintenance shop
8	Sulfuric Acid; SafeteeSolv (Parts Cleaner Solvent)	Maintenance shop
9	Mineral Spirits	Maintenance shop
10	Acrylic enamel paint; Permacoat	Maintenance shop
11	Propylene glycol antifreeze	Maintenance shop

Subsection C

TRAINING PLAN MODIFICATIONS TO COMPLY WITH PART 47 HAZCOM STANDARD

PART 46 PLANS

HazCom training must be covered in your Parts 46 and 48 new miner, newly-employed experienced miner, and task training (as well as in your annual refresher training if you desire). All part 46 and 48 training plans will have to be updated to incorporate the new HazCom training requirements. MSHA has prepared the required modifications for these three types of training. Simply print out the three attached addendums, attach them to your written plan, and make sure HazCom is included in all three types of training.

Part 46 Addendum to Existing Training Plan

Part 46.5 **New Miner Training**

Part 46.5(b)(4) Instruction on the health and safety aspects of the tasks to be assigned

Subject: 46.5(b)(4)	**Training Methods**	**Course Materials**	**Evaluation Method(s)**
Information about the physical and health hazards of chemicals in the work area	Lecture, discussion, audio/video or other	MSHA raining modules, company safety rules, MSDSs used at the mine or other	Oral and/or written questions or other
Protective measures a miner can take against these hazards	Lecture, discussion, demonstration, audio/video or other	Protective equipment, copies of MSDSs used at the mine or other	Oral and/or written questions, demonstration or other
Contents of the mine's HazCom program	Lecture, demonstration, discussion, audio/video or other	Company policy, information on where to find HazCom information or other	Oral and/or written questions, demonstration or other

Part 46 Addendum to Existing Training Plan

PART 46 PLANS Continued

Part 46.6 **Newly hired experienced miner training**

Part 46.6(b)(4) Instruction on the health and safety aspects of the tasks to be assigned

Subject: 46.6(b)(4)	Training Methods	Course Materials	Evaluation Method(s)
Information about the physical and health hazards of chemicals in the miner's work area	Lecture, discussion, demonstration, audio/video or other	MSHA training modules, company safety rules, MSDSs used at the mine, or other	Oral and/or written questions or other
Protective measures a miner can take against these hazards	Lecture, discussion, demonstration, audio/video or other	Protective equipment, copies of MSDSs used at the mine, or other	Oral and/or written questions, demonstration or other
Contents of the mine's HazCom program	Lecture, demonstration, discussion, audio/video or other	Company policy, information on where to find HazCom information, or other	Oral and/or written questions demonstration or other

Part 46 Addendum to Existing Training Plan

Part 46.7 New task training

Part 46.7(a) Miner who is reassigned to a new task in which he or she has no previous work experience.

Also, HazCom will be provided when a new hazardous chemical is introduced into a miners work area and when an existing chemical is found to possess a new hazard.

PART 46 PLANS Continued

Subject: 46.7(a)	Training Methods	Course Materials	Evaluation Method(s)
Information about the physical and health hazards of chemicals in the miner's work area	Lecture, discussion, audio/video or other	MSHA training modules, company safety rules, MSDSs used at the mine or other	Oral and/or written questions or other
Protective measures a miner can take against these hazards	Lecture, discussion, demonstration, audio/video or other	Protective equipment, copies of MSDSs used at the mine or other	Oral and/or written questions, demonstration or other
Contents of the mine's HazCom program	Lecture, demonstration, discussion, sudio/video or other	Company policy, information on where to find HazCom information or other	Oral and/or written questions, demonstration or other

Part 48 Surface Plans

HazCom training must be covered in your Parts 46 and 48 new miner, newly-employed experienced miner, and task training (as well as in your annual refresher training if you desire). All part 46 and Part 48 training plans will have to be updated to incorporate the new HazCom training requirements. MSHA has prepared the required modifications for these three types of training. Simply print out the three attached addendums, attach them to your written plan, and make sure HazCom is included in all three types of training.

Part 48 (Surface) Addendum to Existing Training Plan

Part 48.25 **Training of new miners; minimum courses of instruction; hours of instruction**

Part 48.25(12) Health and safety aspects of the tasks to which the new miner will be assigned

Subject: 46.25(12)	**Training Methods**	**Course Materials**	**Evaluation Method(s)**
Information about the physical and health hazards of chemicals in the work area	Lecture, discussion, audio/video or other	MSHA raining modules, company safety rules, MSDSs used at the mine or other	Oral and/or written questions or other
Protective measures a miner can take against these hazards	Lecture, discussion, demonstration, audio/video or other	Protective equipment, copies of MSDSs used at the mine or other	Oral and/or written questions, demonstration or other
Contents of the mine's HazCom program	Lecture, demonstration, discussion, audio/video or other	Company policy, information on where to find HazCom information or other	Oral and/or written questions, demonstration or other

Part 48 Surface Plans Continued

Part 48 (Surface) Addendum to Existing Training Plan

Part 48.26 **Experienced miner training**

Part 48.26(11) Health and safety aspects of the tasks to which the new miner will be assigned

Subject: 48.26(11)	**Training Methods**	**Course Materials**	**Evaluation Method(s)**
Information about the physical and health hazards of chemicals in the miner's work area	Lecture, discussion, demonstration, audio/video or other	MSHA training modules, company safety rules, MSDSs used at the mine, or other	Oral and/or written questions or other
Protective measures a miner can take against these hazards	Lecture, discussion, demonstration, audio/video or other	Protective equipment, copies of MSDSs used at the mine, or other	Oral and/or written questions, demonstration or other
Contents of the mine's HazCom program	Lecture, demonstration, discussion, audio/video or other	Company policy, information on where to find HazCom information, or other	Oral and/or written questions demonstration or other

Part 48 Surface Plans Continued

Part 48 (Surface) Addendum to Existing Training Plan

Part 48.27 **Training of miners assigned to a task in which they have had no previous experience; minimum courses of instruction.**

Part 48.27(a)(1) Miners assigned to new work tasks as mobile equipment operators, drilling machine operators, haulage and conveyor system operators, ground control machine operators, and those in blasting operations shall not perform new works tasks in these categories until training prescribed in this paragraph and paragraph (b) of this section has been completed.

Part 48.27(c) Miners assigned a new task not covered in paragraph (a) of this section shall be instructed in the safety and health aspects and safe work procedures of the task

Also, HazCom will be provided when a new hazardous chemical is introduced into a miner's work area and when an existing chemical is found to possess a new hazard.

Subject: 46.27(a)(1)/(c)	**Training Methods**	**Course Materials**	**Evaluation Method(s)**
Information about the physical and health hazards of chemicals in the miner's work area	Lecture, discussion, audio/video or other	MSHA training modules, company safety rules, MSDSs used at the mine or other	Oral and/or written questions or other
Protective measures a miner can take against these hazards	Lecture, discussion, demonstration, audio/video or other	Protective equipment, copies of MSDSs used at the mine or other	Oral and/or written questions, demonstration or other
Contents of the mine's HazCom program	Lecture, demonstration, discussion, sudio/video or other	Company policy, information on where to find HazCom information or other	Oral and/or written questions, demonstration or other

HazCom Fill-In-The-Blank Test

1. HazCom training must include training for each hazardous chemical miners are exposed to in the following areas: _____ and _____. Training on the mine's written _____ must be included.

2. The identity used for each hazardous chemical workers are exposed to must be such that it can be cross referenced between the MSDS, the label, and the _____.

3. When must a miner receive HazCom training? _____ _____.

4. You can find out about your company's HazCom program by reading it's _____ _____.

5. All except temporary containers containing hazardous chemicals brought on the mine site must be _____.

6. MSDS stands for _____.

7. Almost all mine products contain enough crystalline silica to require that the mine prepare an _____ and _____ for its product.

8. The date the HazCom standard goes into effect is _____ for mines with 6 or more employees and _____ for mines with 5 or less employees.

9. An unlabeled temporary portable container must be _____ at the end of the shift.

10. The first step in developing a HazCom program is preparing a list of _____ at the mine and securing copies of the _____ for each.

11. Containers of raw materials produced at the mine are exempt from the _____ requirement.

12. A label must include the identity of a hazardous chemical and a brief summary of the chemical's most serous _____.

13. Consumer products need not be included on the company's hazardous chemical list if they are used for the purpose the manufacturer intended and the use does not expose the miner more often and for longer periods of time than _____ use would.

14. Hazardous chemicals in temporary portable containers must either be labeled or _____.

15. The maximum size for a temporary portable container is _____.

16. The maximum number of miners who can use a temporary portable container is _____.

17. MSDSs on the hazardous chemicals a miner is exposed to must be _____ _____ to exposed miners.

18. How long must miners be notified before disposing of an MSDS? _____.

19. What types of training must include HazCom training? _____, _____, _____, and possibly_____.

20. Initial HazCom training can be incorporated into what type of training?_____ _____.

21. You must provide independent contractors information about your _____.

21. hazardous chemicals
20. annual refresher training (but this should be completed before the date the standard goes into effect).
19. new miner, new experienced miner, task, hazard
18. 3 months
17. readily available
16. not specified
15. not specified
14. emptied at the end of the shift
13. ordinary consumer
12. hazards
11. labeling
10. hazardous chemicals, MSDS
9. emptied
8. September 23, 2002 and March 21, 2003
7. MSDS and warning label
6. material safety data sheet
5. labeled
4. written program
3. before he/she is exposed to a hazardous chemical
2. hazardous chemical list
1. hazards, protective measures, written program

Section 10
Electrical Grounding Systems & Testing*

Action Items

1. If your electrical system has not been inspected by a competent licensed-commercial electrician, have it done and make the corrections needed to meet the requirements of the National Electric Code.

2. Keep fuses available for replacement which have the correct "ampere" and "current interrupting" ratings. The electrical inspection should provide you with the correct numbers for these two parameters. Search for the cause of fuses which continually open and avoid the temptation to arbitrarily replace them with higher-rated fuses. This dangerous practice will overheat wires destroying the insulation and greatly increasing the likelihood of fire. It also increases the chance of electrocution in the event of a ground fault condition.

3. Install ground fault circuit interrupters on all outlets used for hand tools.

4. Purchase battery-powered hand tools whenever this is feasible. Use a combination of double insulated hand tools and GFCI protection when battery-powered tools are not available. Cords with GFCI protection and multiple outlets are also available.

5. Use ground-fault detector lights on ungrounded delta systems.

* Note that this section was reviewed and edited by Todd Wilen, Energy Consultant, 6664 59th Avenue SE, Fredonia, ND 58440-9776 (Telephone (701) 485-3456 or email consulting@gigawatt.biz)

6. Test electrical cords frequently using a simple continuity tester to make sure the ground wire is continuous.

7. Test resistance/impedance between equipment frames and the service entrance annually or whenever changes are made and maintain below 1 ohm.

8. Test or have the grounding electrode system resistance tested annually using the fall-of-potential method as discussed here, and have the measured value available for the MSHA inspector. Ideally, for the safety of you and your employees, this resistance should be below 5 ohms. The law does not require this ideal resistance, but follows the requirements of the National Electrical Code (25 ohms maximum or drive in an additional ground rod, which may or may not even get you 25).

Proper Grounding and Grounding Electrode System Testing

What is a ground fault? – Under normal conditions in a single-phase system used for small motors, lights, handtools, etc. the current flow on the two current-carrying conductors (the "hot" and the neutral) is balanced. In a three-phase system, two or more "hot" wires feed the load, and the current flow will be balanced among them. If something causes one conductor to contact a metal equipment frame, a ground fault condition occurs, and the operator of the equipment is in danger of electrocution.

This **ground fault** condition may last indefinitely if the frame is not grounded. If a person, who is not grounded, uses the equipment and even touches the frame, he/she may be able to use the tool and remain totally unaware that a **ground fault** condition exists. However, if the person is grounded and touches the energized frame, current will pass through the person's body to ground and the person will receive a shock, which may or may not cause electrocution. The magnitude of this shock depends upon how much current flows through the person, which in turn depends upon factors such as the voltage, how well grounded the person is, the resistance of the person's body to current flow, the direction of current flow through the person's body etc.

How can this potential hazard be prevented? If a Ground Fault Circuit Interrupter (GFCI) is in use, it will stop current flow as soon as current begins to flow through the person's body to ground. GFCI protection is the preferred safe way to prevent electrocution due to ground faults. However, many circuits, for one reason or another,

cannot be GFCI protected. In these, if the energized frame of the equipment is properly grounded, current will flow from the frame through the **equipment grounding conductor** and back to the grounding bus, which is bonded to the neutral bus in the building's service entrance. The **equipment grounding conductor** simply offers an alternate path for the **fault current** to flow in the event of a ground fault. Ground fault detector lights are used to detect ground faults in ungrounded three-phase systems (see Figures 10-1 and 10-2)

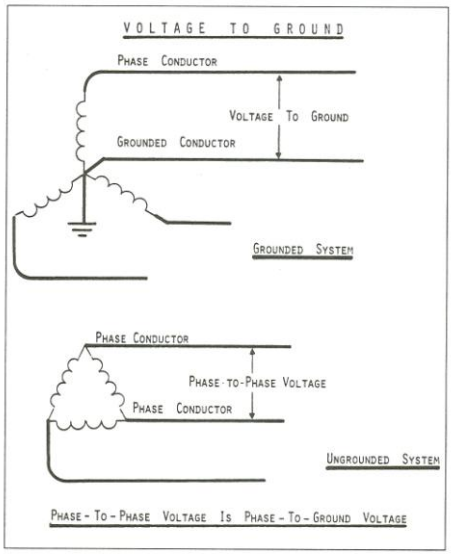


Figure 10-1 – Voltage to Ground – Wye and Delta (from "Electrical Grounding", Third Edition, Based on the 1993 National Electrical Code, by Ronald P. O'Riley, Delmar Publishers Inc., 1993).

What is the advantage of having this alternate path for current to flow? If the **equipment grounding conductor** has sufficiently low resistance to current flow (less than 1 ohm), it will allow enough current to flow to cause **overcurrent protective devices** (fuses or circuit breakers) to open, stopping the flow of current to the faulty equipment as soon as the fuse opens the circuit, which is dependent upon it's clearing time (time it takes for the element to melt and interrupt the arc that occurs as the element opens).

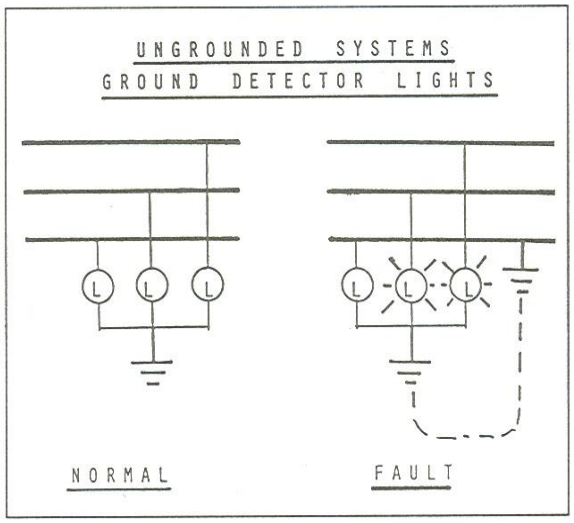


Figure 10-2. Ground Detector Lights for Ungrounded Systems (from "Electrical Grounding" – See Fig. 10-1).

How can one be sure the equipment grounding system is functioning correctly? There are many requirements for equipment grounding systems to function correctly including:

1. The system must be wired correctly, meeting all requirements of the National Electric Code. An inspection by a **competent** licensed commercial electrician followed by correction of faulty equipment should ensure that the system is wired correctly.

2. Always replace fuses and circuit breakers with the correct size and type, as originally installed by the competent electrician. The ampere rating must be correct for the circuit wiring and components. Since a fault current is many times the ampere rating of an overcurrent device, there is danger of the device becoming damaged before it is able to stop this large current flow. For this reason, each overcurrent device must also

have a current interrupting rating (IR or Underwriters Current Limiting (CL) rating). The IR or CL must be sufficient to carry the calculated maximum fault current. The person designing the electrical system will perform this calculation and determine that downstream electrical components have sufficient "withstand" capabilities to carry the calculated fault current (Note that short-circuit-current studies and protective-device coordination in industrial applications are typically beyond the capability of most electricians. Because of the number of factors involved, to perform this work correctly is a significant undertaking).

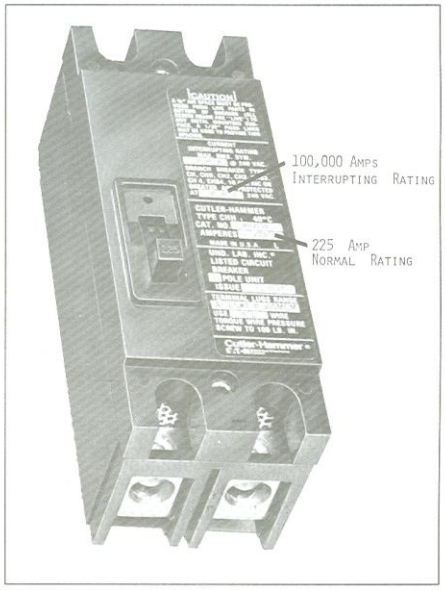


Figure 9-3. 225-Amp Circuit Breaker with 100,000 Amp Interrupting Rating (from "Electrical Grounding" – See Fig. 9-1). (IR)

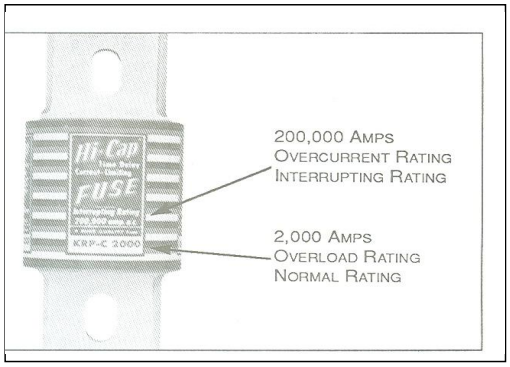


Figure 9-4. 2000-Amp Fuse with 200,000 Amp Interrupting Rating (from "Electrical Grounding" – See Fig. 9-1).

3. Electrical equipment fastened in place must be grounded if it is within 8 feet vertical distance or 5 feet horizontal distance of a grounded surface. Noncurrent carrying metal parts in contact with electrical equipment, likely to become energized, or when subject to contact by persons must be grounded. The **equipment grounding conductor** connecting equipment frames to the neutral bus at the service entrance must be adequately sized, continuous, and wired correctly, so that it offers only minimal resistance to current flow (less than 1 ohm).

4. The resistance between equipment frames and the neutral bus at the service entrance must be tested and maintained below 1 ohm. In an AC system, the impedance would need to be maintained at less than 1 ohm. The distinction between resistance in DC and impedance in AC is important, because, while resistance alone has the greatest effect on current flow in a DC system, resistance, inductive reactance and capacitive reactance all affect current flow in an AC system. For example, a seemingly harmless condition such as passing the **equipment grounding conductor** through a steel raceway without proper bonding and other precautions, can greatly impede the flow of AC current

through this conductor and render it unsuitable to provide ground fault protection.

What happens to the fault current once it reaches the grounding bus in the service entrance? The fault current follows both the grounding electrode to ground and the **grounded** (neutral) conductor back to the transformer or generator. The portion of the overall fault current following a particular path is dependent upon the resistance to current flow of that path. Unless the grounding electrode system resistance is very low, nearly all of the fault current will flow through the grounded neutral conductor.

If fault current flows through the neutral conductor back to the transformer or generator, what is the purpose of the grounding electrode system? The purposes of the grounding electrode system, which is connected to the neutral conductor at the service entrance, are said to include conducting current to ground from:

- Lightening Surges
- Line Surges
- Unintentional Contact with Higher Voltage Lines
- Help Stabilize voltage to ground during normal operations
- Possible facilitation of overcurrent device operation in case of ground fault on a solidly grounded system
- Provide an additional path for the flow of fault current

In grounding electrode systems with excessively-high ground resistance, or even in those systems just meeting the minimum required standards, the grounding electrode system resistance is much too high to allow sufficient current to flow to trip correctly-sized circuit breakers or to blow fuses. Current which goes to the "grounding electrode system" must flow into the earth, then through the earth back to the transformer or generator grounding electrode system, then to the transformer or generator ground. Because of this high resistance (NEC wants you to use an additional ground rod if above 25 ohms – Figure 10-5), simply connecting equipment frames

to a ground rod or other grounding electrode system will not protect a worker from electrocution in the event of a ground fault.

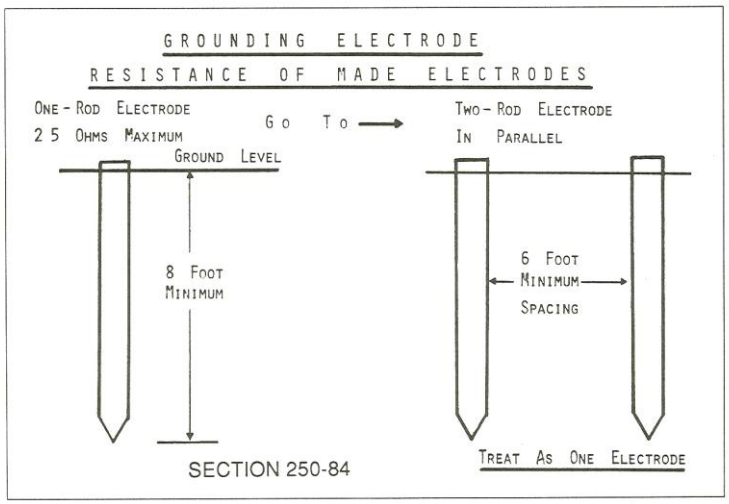


Figure 10-5. Requirements for spacing electrodes when the resistance is more than 25 ohms (From "Electrical Grounding" – See Figure 10-1)

Does the grounding electrode system protect personnel during lightening or high voltages from other sources? No:

1. If a lightening bolt or other high-voltage surge from an external electrical source energizes any frame in the plant, every frame in the plant becomes energized because they are all connected to the ground bus at the service entrance.

2. When the transient occurs, if a difference in potential exists between the energized components and anything else that you happen to be touching exists, your body may become part of the path between these different potentials, and you may be electrocuted. Take immediate steps to avoid

this situation during a lightening storm such as going inside a building or into a vehicle with a metal roof for protection.

What are some possible grounding electrode system types?

- Driven rod
- Pipe electrode
- Plate electrode
- Ground grid

Testing Grounding System Resistance

How often are mines required to test grounding systems?

30 CFR Parts 56/57.12028 -- testing grounding systems.

- Continuity and resistance of grounding systems shall be tested immediately after installation, repair, and modification; And annually thereafter.
- A record of the resistance measured during the most recent tests shall be made available upon request by the secretary or his duly authorized representative.

Testing Continuity of the Equipment Grounding Conductor

- "Continuity" between equipment frames and the ground bus at the service entrance is tested by measuring the resistance between the two points.
- Conductors in fixed installations that are not subject to vibration damage and where you can see by eye that the system is continuous, can be visually inspected instead of making actual measurements.

- Electric cords that supply power tools and portable or mobile equipment must be tested. (not applicable to double insulated tools or where protected by a GFCI that trips at 5 ma or less).
- Testing is not required if a fail-safe ground wire monitor is used to continuously monitor the grounding circuit and which will cause the circuit protective devices to operate when the ground conductor continuity is broken.
- The **grounding electrode conductor** connecting the grounding electrode to the **equipment grounding conductor** and the grounding electrode system must also be tested.
- A record of the most recent tests must be kept and made available to the MSHA inspector. MSHA wants the test results to be recorded in resistance value in ohms.

Testing Grounding Electrode System Resistance

- "Grounding electrode system resistance" is tested using a tester that has been specifically designed for this purpose.

- The accepted technique is called the "fall-of-potential", 3-Point, or 62% method.

- Grounding electrode system resistance cannot be tested using an ordinary ohm meter, or an insulation tester (Also called a Meggar), or a Welder. Most suitable instruments cost more than about $600.

- The instrument supplies the current to be measured at a frequency different than 60 Hz to avoid interference from stray currents. Too great a difference from 60 Hz will also cause errors because ground resistance (impedance) varies with frequency.

- An instrument that uses dc should be avoided due to problems with polarization and electro-osmosis.

- The leads from the instrument to the electrodes should be spaced as far apart as possible to minimize effects of mutual inductive reactance and capacitance.

- There are several instruments on the market with prices ranging from about $600 to $3000 depending on features.

- An inferior instrument will give readings that vary widely depending upon probe resistance.

Measuring Ground Bed Resistance – How is it Done Safely?

- By Following The Safe Procedures Recommended By The Instrument Manufacturers. **Before starting:**
    - Check for voltage or current in the system
    - Disconnect power
    - Tag out
    - Lock out

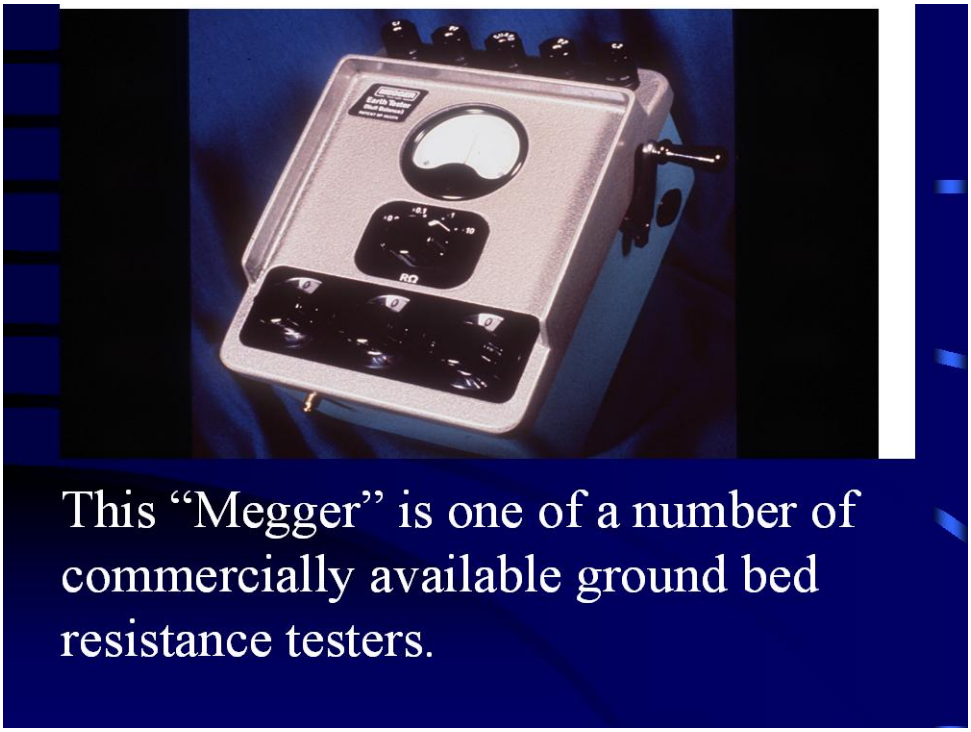


Figure 10-6. Meggar Brand 3-Terminal Ground Resistance Testers from Biddle Instruments.

Follow the instrument manufacturers’ procedures.
The following description is to aid understanding and help you get started.

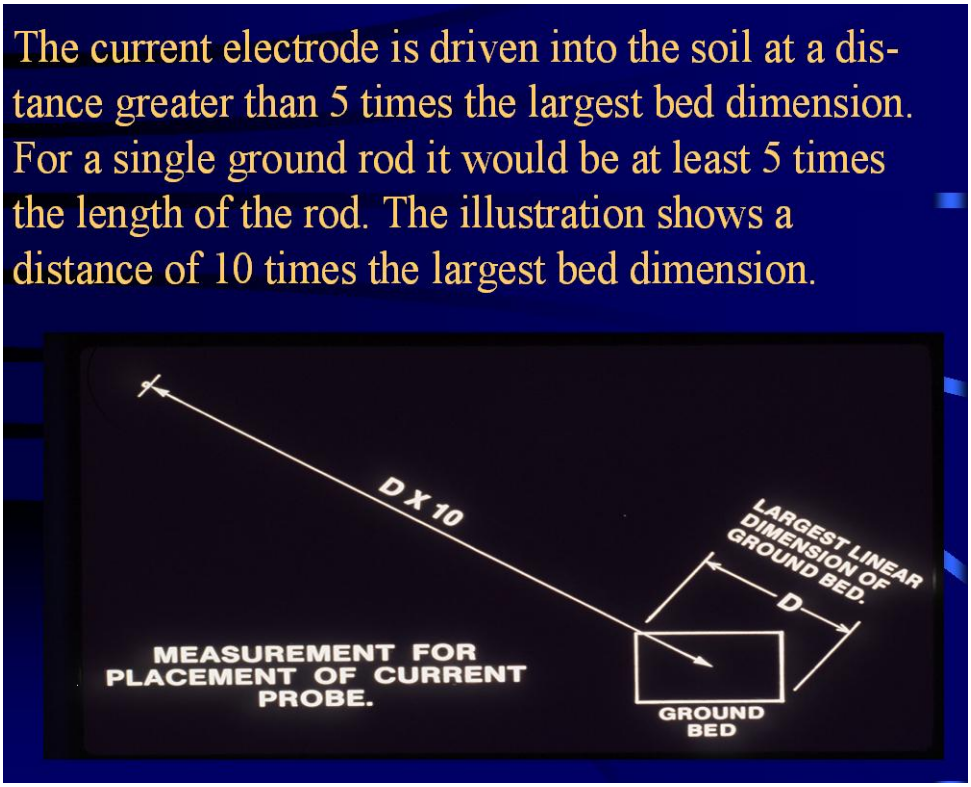


Figure 10-7. Distance From Ground Bed to Current Probe.

Figure 10-8

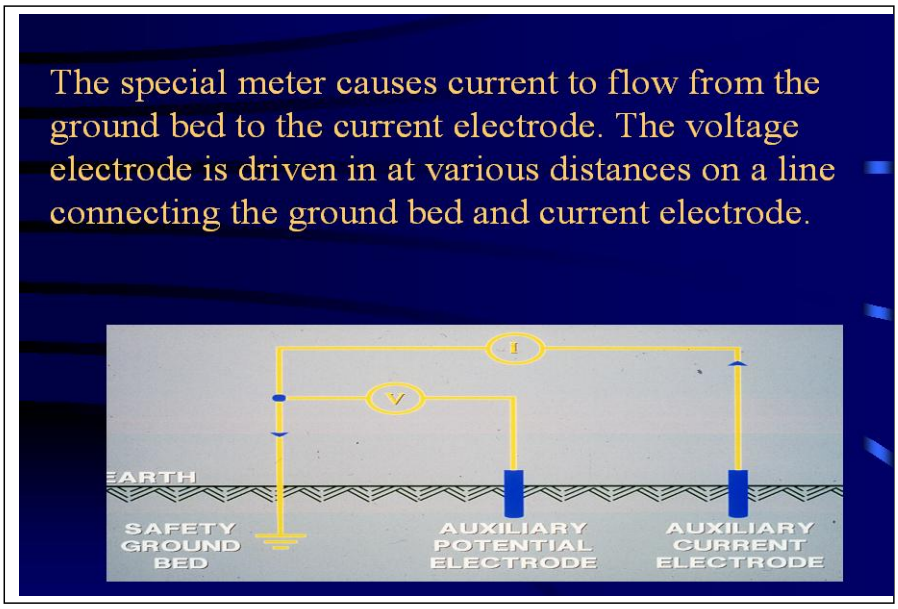


Figure 10-9

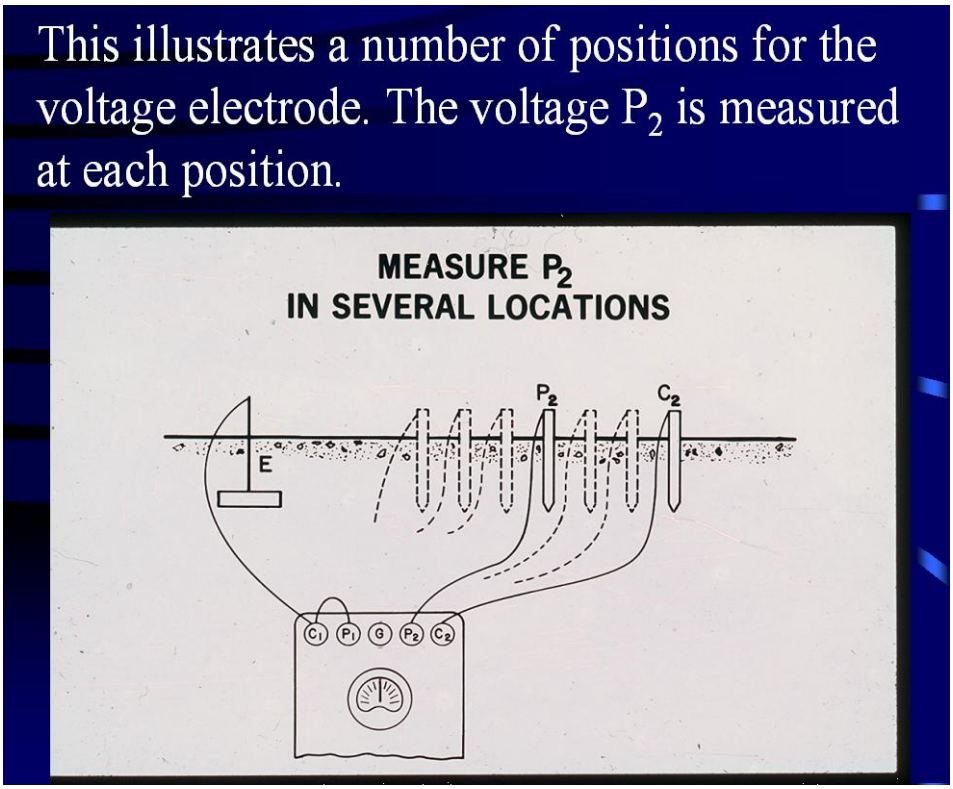


Figure 10-10. Illustration of Connections on Ground Bed Resistance Meter and Current and Potential Electrode Positions Measured.

How Are the Resistance Values Calculated?

- The resistances are calculated from the measured voltages and the measured or known current -- R=P2/I, where R is the resistance and I is the current in amps.

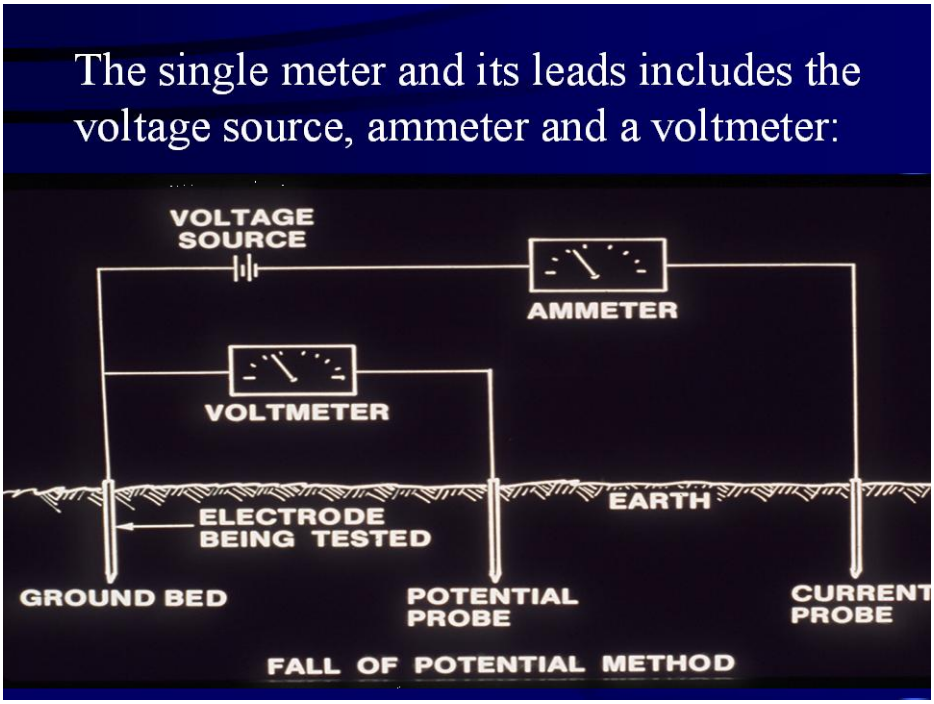


Figure 10-11. Functions Included in the Ground Bed Resistance Meter.

What to Expect in Performing the Test

- At positions close to either the grounding electrode system or the instrument's current electrode, resistances change rapidly with distance from the electrode.

- The readings become constant at about 62 % of the distance from the grounding electrode system to the current electrode. At this distance, the current passes through a much larger cross-sectional area of earth than it does at distances closer to either the grounding electrode system or current electrode. For example, right next to a ground rod the cross-sectional area of earth only equals the surface area of the rod.

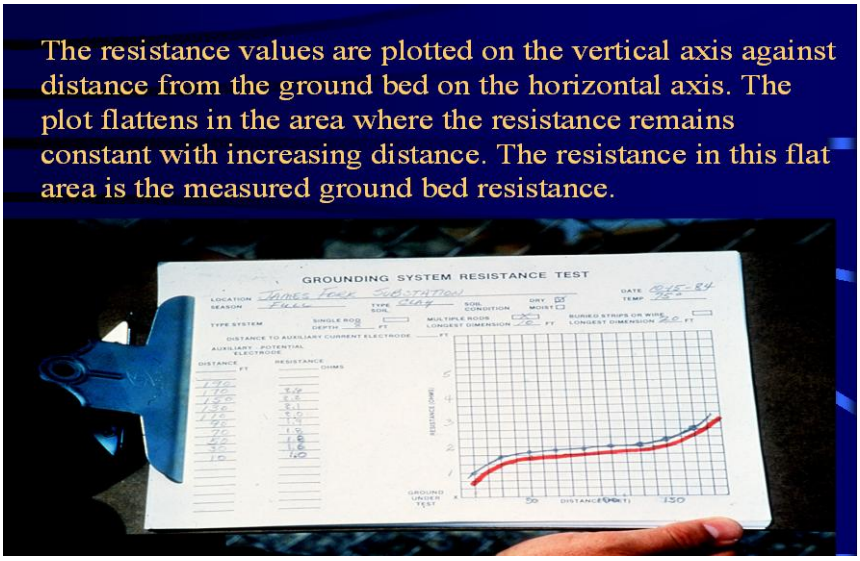


Figure 10-12. Graph of Resistance Vs. Distance from the Ground Bed.

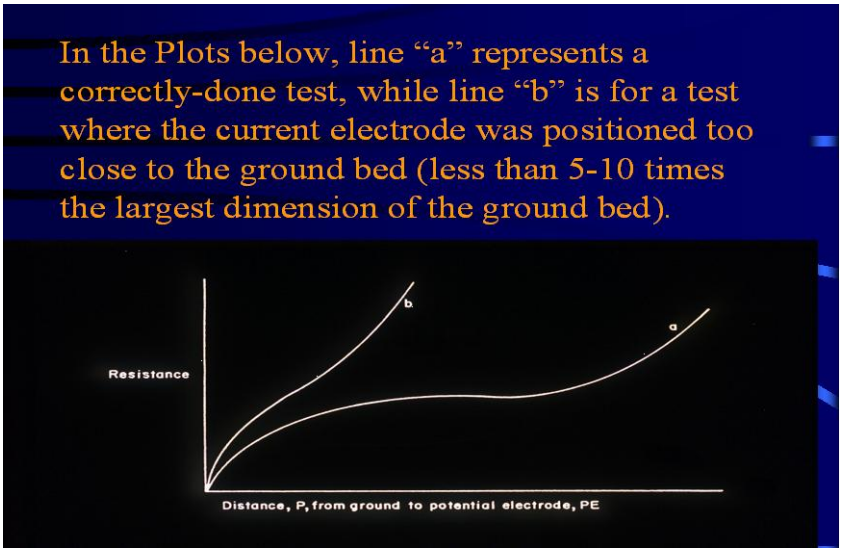


Figure 10-13. Graph of Resistance Vs. Distance form Ground Bed for Correctly- and Incorrectly-Made Measurements.

Table 10-1. Some of The Intruments Available For Grounding Electrode System Resistance Testing by the Fall-Of-Potential Method – All have different features.

Supplier	Model	Web Site	Phone NO.
AEMC Corporation	3620 Analog	http://www.aemc.com/products/	800/343-1391
AEMC Corporation	3640 Digital	http://www.aemc.com/products/	800/343-1391
Lem	Handy Geo	Http://www.lem.com/	310-373-0966
	Saturn Geo Easy	Http://www.lem.com/	310-373-0966
	Saturn Geo Plus	Http://www.lem.com/	310-373-0966
	Saturn Geo	Http://www.lem.com/	310-373-0966
	Saturn Geo X	Http://www.lem.com/	310-373-0966
Biddle Instruments	Meggar brand ground resistance testers	Http://www.biddleinstruments.com/	
	3 Terminal	Http://www.biddleinstruments.com/	
	DET2/2	Http://www.biddleinstruments.com/	
	DET3/2	Http://www.biddleinstruments.com/	
	DET5/4R	Http://www.biddleinstruments.com/	
	DET62D	Http://www.biddleinstruments.com/	

What are some factors, which determine grounding electrode system resistance?

1. Number of rods or mesh.
2. Length of rods or mesh.
3. Depth of rods or mesh.
4. Ground moisture content should be above about 15 %.
5. The soil should contain some dissolved minerals– clean water is not as good a conductor as water containing high dissolved minerals.
6. The resistance of water to current flow increases with decreasing temperature. Ice at – 15 deg. C has a resistance about 46,000 times higher than water at 20 deg. C.
7. Loams and clays are low while shales, sandstones, and crystalline rocks are high.
8. Particle size range and packing.
9. Location, in particular the distance between ground conductors or electrodes, known as the "sphere of influence".

What are some controls that are available to decrease ground resistance?

- Positive changes in any of the above factors
- There are various special ground rods available that automatically trickle small amounts of minerals into the soil to increase conductivity. These may be oriented horizontally, if necessary. The horizontal systems, which may have holes all along the length of the pipe, work well when properly applied.

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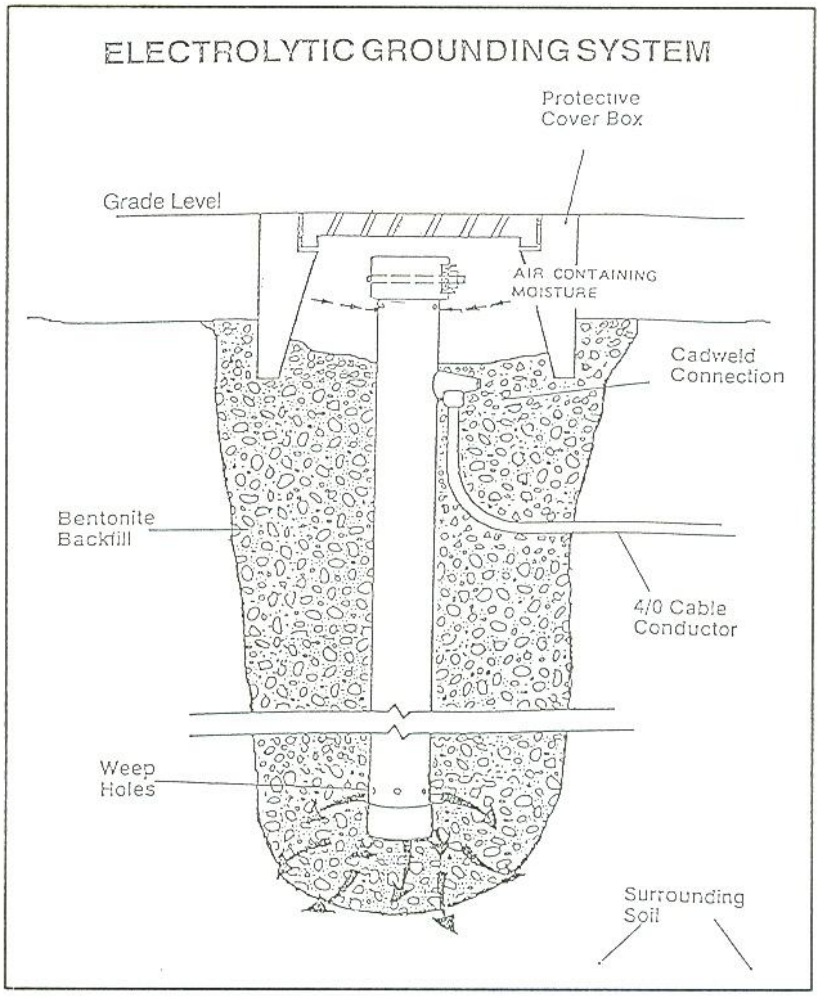

Fig. 10-14 Cutaway view of the installation of an electrolytic ground rod. Courtesy Lyncole XIT Grounding (from "Electrical Grounding" – See Fig. 10-1).