MSHA Handbook Series
Transmittal Sheet

U.S. Department of Labor
Mine Safety and Health Administration

Subject | Handbook Number | Release Number

Coal Mine Health Inspections Procedures Handbook, Chapter 3, Noise
Metal and Nonmetal Health Inspections Procedures Handbook, Chapter N, Noise

1. Explanation of Material Transmitted

REVISED CHAPTER -

Establishes consolidated procedures and guidelines for conducting noise sampling, evaluating sample results and verifying that the operator is in compliance with the noise standard. The chapter also details the P-code policy for Coal and Metal and Nonmetal Mines and discusses technologically achievable engineering and administrative controls. **This supersedes the previously issued noise health inspection procedures.**

2. Action Required

Replace current Coal Chapter 3 with new Chapter 3.

Replace current Metal and Nonmetal Chapter N with new Chapter N.

3. Audience

All Mine Safety and Health enforcement personnel.

3/14/05
4. Approval Authority | Date

Ray McKinney 3/15/05
4. Approval Authority | Date

MSHA Form 7000-7b, Sept. 88 (Revised)

PREFACE

This chapter sets forth procedures and guidelines for conducting noise sampling, evaluating sample results and verifying that the operator is in compliance with the noise standard. The chapter also details the P-code policy for Coal and Metal and Nonmetal Mines and discusses technologically achievable engineering and administrative controls. Express approval of the Administrator for Coal Mine Safety and Health and the Administrator for Metal and Nonmetal Mine Safety and Health is needed to authorize any modifications to this manual. The procedures and guidelines in this chapter replace previously issued directives on this subject. Compliance related instructions in the MSHA Program Policy Manual remain in effect.

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Chapter N - NOISE

I. Purpose

The purpose of this chapter is to establish procedures and guidelines for conducting noise sampling, evaluating sample results and verifying that the operator is in compliance with the noise standard. The chapter also implements the P-code policy for Coal and Metal and Nonmetal Mines and discusses technologically achievable engineering and administrative controls. **This supersedes the previously issued noise health inspection procedures.**

II. Introduction

Many miners are exposed to loud and sustained noise levels. The Mine Safety and Health Administration (MSHA) has determined that approximately 13.4% of miners will suffer material hearing impairment during their working lifetime unless preventive measures are taken to reduce overexposures. Noise sampling is an essential component in identifying miners whose exposures must be reduced to protect them from the risk of occupational noise-induced hearing loss.

III. Inspections

A. Noise Sampling Equipment

Full-shift noise samples must be taken using a personal noise dosimeter placed on the miner.

The Quest Q-200, Q-300, and Noise Pro DL personal noise dosimeters have multiple internal dosimeters.

1. Dosimeter I must be set for evaluating noise related to the 85 dBA action level. It must operate with the A-weighted network, slow response, 80 dBA threshold, 90 dBA criterion level, and 5 dBA exchange rate.

2. Dosimeter II must be set for evaluating noise related to the 90 dBA permissible exposure level (PEL). It must be set to operate with the A-weighted network, slow response, 90 dBA threshold, 90 dBA criterion level, and 5 dBA exchange rate.

3. Dosimeter III, if applicable, must be set at the same parameters as Dosimeter II. [not used for enforcement purposes].

All Quest personal dosimeters must be set to the parameters listed in Table 1. Technical Support personnel will confirm the settings for Quest dosimeters during the annual calibration and lock the parameters in place. This will prohibit the settings from inadvertently being changed in the field.

Table 1

Quest Parameter Settings

Measurement Parameter	**Value**		
	Dosimeter I (Action Level)	**Dosimeter II** (PEL)	**Dosimeter III** (PEL)
Calibration (QC-10)	114	114	114
Range	HI	HI	HI
UL (Upper Limit Level)	117	117	117
CL (Criterion Level)	90	90	90
ER (Exchange Rate)	5	5	5
TL (Lower Threshold Level)	80	90	90
Fast/Slow (Response Time)	Slow	Slow	Slow
A/C (Frequency Weighting)	A	A	A

The **Ametek MK-2 and MK-3** personal noise dosimeters have multiple internal dosimeters. The low threshold dose reading must be set for evaluating noise related to the 85 dBA action level. It must be set to operate with the A-weighted network, slow response, 80 dBA threshold, 90 dBA criterion level, and 5 dBA exchange rate.

1. The low threshold dose reading shows on the display screen as a **solid** "DOSE %". The high threshold dose reading must be set for evaluating noise related to the 90 dBA permissible exposure level (PEL). It must be set to operate with the A-weighted network, slow response, 90 dBA threshold, 90 dBA criterion level, and 5 dBA exchange rate.

2. The high threshold dose reading shows on the display screen as a **flashing** "DOSE %". Enter these readings as they are shown on the dosimeter display; do not round them off.

All Ametek personal noise dosimeters must be set to the parameters listed in Table 2. After the initial setup, Technical Support personnel will set the option switch settings during the annual calibration and the settings must not be changed.

Table 2

Ametek MK-2 and MK-3
Option Switch Settings

The option switch settings on the Ametek MK-2 and MK-3 personal noise dosimeters must be set as follows:

SWITCH NO. 1	ON	SLOW RESPONSE
SWITCH NO. 2	OFF	80 dBA THRESHOLD
SWITCH NO. 3	OFF	80 dBA THRESHOLD
SWITCH NO. 4	OFF	90 dBA CRITERION LEVEL
SWITCH NO. 5	OFF	90 dBA CRITERION LEVEL
SWITCH NO. 6	OFF	5 dBA DOUBLING RATE
SWITCH NO. 7	OFF	5 dBA DOUBLING RATE
SWITCH NO. 8	OFF	2 SEC >115 dBA TIME DELAY
SWITCH NO. 9	OFF	A WEIGHTING

Note: Use MSHA-approved permissible personal noise dosimeters and sound level meters in metal and nonmetal gassy mines and in underground coal mines, where required.

B. Frequency of Noise Sampling Equipment Calibration

Personal noise dosimeters and acoustical calibrators are required to be calibrated annually. A calibration schedule for all dosimeters and calibrators has been established for each district. The schedule must be strictly adhered to by each district to assure that all dosimeters and calibrators are properly calibrated. The calibration schedule established for M/NM districts is provided in Appendix 7. Dosimeter calibration schedules for Coal are in the District offices. The address for shipping dosimeters and calibrators is as follows:

Mine Safety and Health Administration
Chief, Physical and Toxic Agents Division
Pittsburgh Safety and Health Technology Center
626 Cochrans Mill Road, Building 38
Pittsburgh, PA 15236
(412) 386-6565 (Acoustical Calibration Lab)

C. Noise Sampling Strategy

1. Identify Miners to be Sampled

Observations and/or measurements using a sound level meter (SLM) or a personal noise dosimeter may be used to identify miners exposed to sound levels equal to or greater than 80 dBA. Miners exposed to sound levels equal to or greater than 80 dBA should be considered as candidates for a full shift, personal noise sampling. If a miner needs to shout to be heard a few feet away, the miner may be overexposed to noise.

Determine miners exposed to sound levels equal to or greater than 80 dBA by considering:

- high risk occupations;
- exposure conditions at the time of inspection;
- prior sampling history at the mine;
- reading of sound level meter or personal noise dosimeters; and
- any other information such as the mine's sampling records.

Typical mining occupations exposed to high sound levels include, but are not limited to, roof bolters, shuttle car operators, mobile bridge conveyor operators, shear operators, continuous miner operators, drillers, stone cutters, mobile equipment operators (truck, bulldozer, front-end loader, scraper, etc.), mechanics, laborers, and operators of crushers, mills, and screens.

Samples should be collected on the normal work shift and on off-shifts and week-ends where noise activities are present. At a minimum, miners who have the greatest risk of overexposure to noise should be identified and sampled.

When sampling at Metal / Nonmetal mines, enforcement personnel should include a representative number of miners from each of the high risk occupations at each mine. However, when previous sampling has demonstrated that adequate engineering and administrative controls are in place to ensure compliance, and there is no history or little likelihood of overexposure for that occupation at that mine, then sampling may not be necessary as deemed by the District Office. If sampling is not performed, enforcement personnel must document in the inspection notes the controls being used and the reason they believe miners are not at risk of overexposure to noise.

When sampling at Coal mines, the sampling strategy requirements for Coal should be followed. These requirements are provided in Section C.3.

When a sample based on the 90 dBA PEL produces a dosimeter reading greater than 100 percent but less than 132 percent, a follow-up noise sample is recommended within the next 6 months. All previously sampled miners or occupations must be re-sampled, if available. If all or some are not available, other available miners must be substituted.

2. <u>Determine a Miner's Full-Shift Noise Exposure</u>

A personal noise dosimeter must be used to determine a miner's full work shift noise exposure. Only full-shift samples are used to determine compliance with MSHA's noise standard. Because compliance with the permissible exposure level (PEL) and action level (AL) is determined using different thresholds (90 dBA and 80 dBA, respectively), MSHA's personal noise dosimeters are capable of simultaneously recording data for both thresholds.

3. Sampling Strategy - Coal Only

Enforcement personnel must remain in the work area/section where sampling is being conducted to ensure the sample(s) are representative of the normal activities for the entire sampling shift. Normally, when sampling areas outside the production section, the enforcement personnel should not remain with the miners for the entire sampling shift because of their logistics. Instead, the inspector must spend sufficient time to observe and record the operating conditions and work activities in the area, the noise controls in use, a general description of the conditions of the controls, and potential sources of noise exposure.

a. Mechanized Mining Units (MMUs)

A full-shift sample must be conducted on at least five (5) miners performing different occupations, if available, on each MMU. These must include the miner operator(s), roof bolters, shuttle cars and any mobile bridge conveyor operators. All MMUs will be sampled on an annual basis. The minimum number of noise samples expected to be completed each year, on MMUs at underground mines, will be based on the number of producing MMUs as of the first of each month averaged over the fiscal year. A representative number of samples will be collected on off-shifts and weekends where such activities are present.

b. Outby Areas Underground (Areas outside of production)

A full-shift sample must be collected from a representative number of outby miners where high levels of noise may exist. These should include, but not be limited to, motormen and belt cleaners. A representative number of outby miners must be sampled on an annual basis at each underground mine.

c. Surface Areas of Underground Mines

A full-shift sample must be conducted on at least five (5) miners, if available, on the surface area of an underground mine where high levels of noise may exist. All surface areas of underground mines are to be sampled on an annual basis.

d. Surface Mines and Surface Facilities

A full-shift sample must be conducted on at least five (5) miners, if available, at each surface mine. These must include bulldozer operators and other heavy equipment operators. All surface mines and surface facilities are to be sampled on an annual basis. The number of noise samples expected to be completed will be based on the number of the above listed producing mine areas as of the first of each month averaged over the fiscal year. A representative number of samples will be collected on off-shifts and weekends where such activities are present.

e. Follow-up Samples

When a sample based on the 90 dBA PEL produces a dosimeter reading greater than 100 percent but less than 132 percent, a follow-up noise sample is recommended within the next 6 months. All previously sampled miners or occupations must be re-sampled, if available. If all or some are not available, other available miners must be substituted.

The inspector **must** conduct a follow-up full-shift noise exposure sample upon expiration of the abatement time as originally set or extended **if** feasible noise controls have been implemented which may achieve compliance. All previously sampled miners or occupations must be re-sampled, if available. If all or some are not available, other available miners must be substituted.

D. Pre-Inspection and Post-Inspection Procedures

MSHA records, such as previous inspection reports, previous Noise Technical Investigation results, listing of assigned P-codes (see Section J for description of P-codes) and the Uniform Mine File (Mine File), must be reviewed prior to beginning the inspection at the mine.

Before taking each sample, the calibration label on the dosimeter and calibrator must be checked to ensure that the instruments have been calibrated within the past 12 months. A field calibration check must be conducted before and after each sampling shift. If the check indicates that the dosimeter is more than +/- 1.0 dBA of the calibrator, with either calibration check, the instrument or sampling results must not be used. The pre-calibration and post-calibration checks must be conducted with the same calibrator and never interchange the microphone unless it has been recalibrated. Procedural instructions for checking the calibration of the instruments are contained in Appendix 1.

For Coal mines, the record documenting pre- and post-shift calibration checks must be on Form 2000-84 as required by Section F. Include the serial number or MSHA Property Number of the dosimeter and field calibrator. A sample Form 2000-84 is provided in Appendix 4.

For Metal/Nonmetal mines, the record documenting pre- and post-shift calibration checks must be included in the Health Field Notes as required by Section G. Include the serial number or MSHA Property Number of the dosimeter and field calibrator.

After arriving at the mine, the mine inspector must review all the posted administrative controls and during the inspection, determine if they are being followed. All engineering controls must also be checked to determine if they are being maintained. Document this information in the notes.

E. Sampling Inspection Procedures

1. Instructions to the Miner

a. Explain to the miner what you are doing, what the sampling device does, and the reason for the sampling (i.e., the hazard). Emphasize that the personal noise dosimeter or sound level meter is not a tape recording device.

b. Instruct the miner not to remove a personal noise dosimeter or microphone at any time and not to cover the microphone with a coat or other garment. If the miner must leave the mine property during the shift, the inspector should remove the personal noise dosimeter and place it in the "pause" or "standby" mode. Sampling should resume once the miner returns.

c. Instruct the miner not to bump, drop, damage, or tamper with the personal noise dosimeter or microphone. Discourage whistling into, shouting into, or tapping on the microphone.

d. Emphasize the need for the miner to continue to work in a routine manner and report to you any unusual occurrences during the sampling period.

e. Inform the miner when and where the personal noise dosimeter will be removed, and that you will check the equipment and may take sound level meter readings periodically.

f. If a miner objects to wearing the personal noise dosimeter, determine the reasons for the objection. Explain the need for the sampling. If you cannot obtain the cooperation of the miner and another miner performing the same job at the same location is available and cooperative, sample the cooperative miner. If the refusal is an attempt to impede or prevent an inspection, the inspector should attempt to complete any parts of the inspection that do not involve sampling. Afterwards, the inspector's supervisor should be contacted. In such cases, the supervisor is responsible for collecting all the facts, reducing them to writing, and contacting the District or Assistant District Manager. Consult the Program Policy Manual, Volume I, I.103-1, Assaulting, Intimidating or Impeding Inspectors, for current policy on actions to be taken in such circumstances.

2. Dosimeters

Noise exposure measurements must be made in accordance with the instrument manufacturer's recommendations. This requires the dosimeter microphone to be located at the top of the shoulder midway between the neck and end of the shoulder, with the microphone diaphragm pointing in a vertical upward direction. The microphone must be

located on the shoulder that is normally between the principal noise source and the miner's ear (see Figure 1). To the extent practical, the dosimeter instrument and microphone cable must be positioned underneath exterior clothing to minimize potential safety problems and damage to the instrument. The microphone must not be covered by clothing**.** At the start of each sample a wind screen must be attached to the dosimeter microphone in accordance with the instrument's manufacturer's instruction. If the wind screen is lost during sampling, samples requiring enforcement action must be VOIDED. Re-sampling must be conducted as soon as possible.

Figure 1. Placement of the dosimeter microphone.

The personal noise dosimeter must be worn by the miner whose noise exposure is being measured for an entire normal work shift, even if the normal work shift is in excess of 8 hours. Conduct sampling, both initial and follow-up, only when conditions are judged to be normal and representative. If unusual conditions arise during the sampling period then the sample may have to be voided. Re-sampling must be conducted as soon as possible.

<u>Determination of a "Normal" Workshift</u>

a. The following are examples of the types of information that can be used to determine if activities are characteristic of a "normal" representative workshift: the number of truckloads of material processed by a crusher operator; the number of holes or vertical feet drilled by a drill operator; the number of trucks loaded by a shovel operator; the type of product and number of bags produced by a bagging operator; and any indication of operation modifications.

b. A "normal" workshift at many operations may exhibit wide variations in working conditions and activities. Ask the miner if these are "usual" or "unusual" work conditions. Sample results are valid when collected on shifts that lie within the range of normal variations. All corrective actions taken to abate a citation / order must be documented in the body of the termination notice and field notes.

During each full-shift sample, the inspector must observe the miner being sampled as frequently as is necessary to determine that a representative sample is being conducted of the normal activities.

The inspector must observe enough of the work activity to ensure that:

(1) Dosimeters remain in the environment being sampled;
(2) Dosimeters are properly positioned or placed on the miner for sampling;
(3) Dosimeters are not damaged;
(4) Normal mining activities are taking place;
(5) A determination of production is made; and
(6) Noise controls (including administrative controls) are documented, etc.

This requirement does not necessarily preclude the inspector from doing other inspection work while conducting the noise sample. Normally, the inspector will accompany the miners out of the mine.

During sampling it is essential that the sources of the noise exposure be determined. One way this can be accomplished is using a SLM or the dosimeter in the SLM mode. When the source(s) of the exposure cannot be readily identified, make a sketch of the work area including location of the miner(s), noise source(s) and mark on the sketch where the noise readings were taken.

3. **<u>Sound Level Meters - Dosimeters in Sound Level Meter Mode</u>**

MSHA noise dosimeters can be used in the sound level meter (SLM) mode to check sound levels a miner may be exposed to in their work area. The following method can be used to check work area sound levels using a dosimeter in the SLM mode:

a. Calibration checks required in Section D must be followed.

b. The dosimeter microphone must be held at arm's length within one or two feet of the miner's ear in a normal work area, with the microphone pointed upward.

c. Compliance determinations must be based on a full-shift personal noise dosimeter sample.

d. Inspectors should not take noise measurements with sound level meters on moving equipment, such as shuttle cars and bulldozers, unless safe seating arrangements are provided.

4. <u>Sound Level Meters (Non-Enforcement – Metal / Nonmetal)</u>

Sound level meters can be used to check the sound levels in a work area, evaluate sources of noise and determine which miners to select for sampling.

a. Set the sound level meter (SLM) on the "A-weighting" scale and "slow" meter response for all measurements.

b. Check the accuracy of the SLM by performing a pre-sample check with an acoustical calibrator. The instrument must be within +/-1.0 dBA of the calibrator's stated output. Make sure the reading has stabilized and record it in the Health Field Notes. **Note: Do not use the instrument if it is outside the +/- 1.0 dBA tolerance.**

c. In general, hold the SLM at arm's length, keeping your body out of the path of the noise. Hold the microphone within one foot (hearing zone) of the miner's most exposed ear whenever possible. As specified by the manufacturer, hold the microphone either perpendicular (90-degree angle) toward the noise source, pointed at a 70-degree angle toward the source, or pointed directly at the source.

d. Because the needle or digital display on the SLM may fluctuate, observe the readings for of at least 30 consecutive seconds. Ignore any momentary high or low levels.

e. Take several readings for each activity the miner performs during the work shift.

f. Record the sound level reading or range of sound levels on the back side of the Health Field Notes. Also, record the time, location, specific activity of the miner, ID number of any equipment the miner is operating, and any other pertinent information. A sketch may be helpful in showing where the various readings were taken.

g. After sampling, check the accuracy of the instrument with an acoustical calibrator. If the difference between the pre- and post-sampling readings is more than +/- 1.0 dBA from the value of the calibrator, void the data obtained with the instrument.

h. Do not report SLM results to the computer database system. Record them in field notes.

F. Inspection Documentation – Coal

1. The following is a list of observations that **MUST** be described in the field notes:

   a. Administrative noise controls posted on the mine bulletin board. Detail whether they were followed during the sampling shift and if a copy was provided to affected miner(s).

   b. A miner refusing to wear a dosimeter.

   c. Interruptions in the sampling requiring the dosimeter to be placed in the "PAUSE MODE" (i.e., miner leaving mine property).

   d. Factors requiring a sample to be voided. (Includes information from the miners being sampled.)

   e. The sources of noise for the miner(s) being sampled.

   f. Engineering noise controls being utilized that could affect the dose of the miners being sampled; their condition and state of maintenance.

   g. If a citation is being issued, list feasible noise controls not being used to reduce the affected miner(s) dose or any other action or inaction causing the citation to be issued. (Refer to PIB 04-18.)

   h. Follow-up on an existing citation is required, detail the noise controls implemented during the abatement period.

2. An MSHA Form 7000-10P, June 93 (Revised), Noise note page must be completed during an inspection when sampling.

3. Complete the latest MSHA Form 2000-84 for each inspection where noise samples are conducted and review the information for clarity, legibility, and accuracy.

   a. **Mine ID/Contractor ID Number** - Enter the seven digit mine identification number assigned by MSHA and if appropriate, the three- or four-digit contractor ID.

   b. **Event Number** - Enter the event number for the inspection or investigation during which the noise samples were taken.

   c. **AR/RE Number** - Enter the five-digit identification number from the AR/RE card of authorization.

d. **Field Office No**. - Enter the five-digit number assigned to the MSHA CMS&H office under which the coal mine is inspected.

e. **Sampling Date** - Enter date of sample(s) in two-digit month-day-year format. This date must be the same for all noise samples documented on the same Form 2000-84. (Please note that when entering this data in the noise sample database, a four-digit year must be used.)

f. **Activity Code** - Enter the activity code for the type of event during which the noise samples were conducted.

g. **Mine Name** - Enter the mine name as it appears on the Legal ID.

h. **Company Name** - Enter the company name as it appears on the Legal ID.

i. **Sample Number** - The sample number is designated on the form for up to six samples per form.

j. **Sample Type** - Check the box that applies, indicating whether the noise sample is an initial sample or a follow-up sample.

k. **P-code** – Note whether there is a current P-code.

l. **MMU/Pit/Area Sampled** - Enter the MMU/DA/DWP identification number assigned to the section, entity or surface area(s) where the sample was conducted.

m. **Instrument Property Number** - Enter the number from the MSHA property ticket affixed to the instrument or the instrument's serial number.

n. **Calibrator Property Number** - Enter the number from the MSHA property ticket affixed to the calibrator or the instrument's serial number.

o. **Miner's Last Name & First Initial** - Enter the last name and first initial for each miner for which a noise sample was conducted.

p. **Occupation Code** - Enter the MSHA three-digit code that best describes the duties performed during the sample period.

q. **Machine Code** - Enter the appropriate two-digit machine code from the list on the reverse side of MSHA Form 2000-84.

r. **Manufacturer's Code** - Enter the appropriate three-digit manufacturer's code from the list on the reverse side of MSHA Form 2000-84.

s. **Time Start** - Enter the 24-hour clock time when each sample was begun.

t. **Total Sampling Time** - Enter the total sample time in **minutes** for each sample conducted.

u. **Production This Shift** - Enter raw production in tons for the sample period (underground MMUs only).

v. **85 Action Level Dose (Dosimeter I)** - Enter the dose percent value as a truncated whole number (no decimals) for the noise exposure at the 85 dBA action level from Dosimeter I.

w. **90 PEL Dose (Dosimeter II)** - Enter the dose percent value as a truncated whole number (no decimals) for the noise exposure at the 90 dBA permissible exposure level from Dosimeter II.

x. **90 PEL Max** - Enter the maximum dBA level as a truncated whole number (no decimals) indicated for the noise exposure at the 90 dBA permissible exposure level from Dosimeter II.

y. **Upper Control Limit Time** - Enter the duration of exposure in **whole minutes** for noise above 117 dBA.

z. **Calibration Check** - Note the appropriate calibration checks made before and after each noise sample. Check the boxes that apply.

aa. **Type of Hearing Protective Device(s)** - Check the box(es) for all type(s) of HPDs worn by each miner sampled.

ab. **Enrolled in HCP** - Check this box if the miner sampled is enrolled in a Hearing Conservation Program regardless of his or her noise exposure.

ac. **Citation Number** - Enter the citation number **only** if a citation is written for overexposure to noise under 30 CFR Part 62.

ad. **Citation Abatement** – Enter the abatement code from the list on the reverse side of MSHA Form 2000-84 **only** if abatement actions were taken.

ae. **Comments** - Self-explanatory. The date(s) of the annual calibration checks of the dosimeters and/or calibrator may be entered here. Narrative information on the personal protective equipment used and abatement information should be provided here.

NOTE: **VOID** must be entered over the sample column which is not valid due to sampling equipment failure or activities or workshifts which are documented as abnormal. (See page 3-8, Determination of a "Normal" workshift.)

4. A completed **copy** of the most recent MSHA Form 2000-84 must be sent to the appropriate office within each District so the information can be entered into the noise database.

G. Inspection Documentation - Metal/Nonmetal

1. Document the following in the Health Field Notes (refer to Chapter 21, Section V):

a. Clock time the personal noise dosimeter was started.

b. Identification numbers of sampling equipment.

c. Miner's name, job title code, and work location(s).

d. Shift hours per day and days per week worked.

e. Any hearing protection worn including brand, model, type, and noise reduction rating (NRR).

f. Whether a hearing conservation program exists and whether the miner sampled has received audiometric tests and how often.

g. Record what tasks the miner has performed in the time between checks, so that the completed Health Field Notes will describe the miner's full work shift, activity/exposure.

h. Clock times that the personal noise dosimeter and microphone were checked and condition of sampling equipment (if the sample was paused or restarted for any reason, record the times involved) and explain.

i. The activity of the miner, equipment operating in the area, and approximate time spent at each activity/task.

j. General description of noise controls in use.

k. Potential sources of exposure, a concise description of these sources, number of miners affected, and possible additional control measures.

l. Environmental conditions (such as wind conditions, temperature, and humidity).

m. At the end of the sample, record the clock time.

n. Record the run time (displayed in hours and minutes).

o. Record the dose percentage for the 85 dBA action level (80 dBA threshold)

and associated time-weighted average (TWA_8) in dBA.

p. Record the dose percentage for the 90 dBA Permissible Exposure Level (90 dBA threshold) and associated time-weighted average (TWA_8) in dBA.

q. Record the pre - and post - calibration data.

r. Any SLM readings collected.

Whenever possible, perform tasks o, p, and q above in the presence of the miner, a representative of the mine operator, and the miner's representative (if applicable).

H. Decision Table

Provision	Condition	Action required by the mine operator
§ 62.120 ….	Miner's noise exposure is less than the action level.	None.
§ 62.120 ….	Miner's exposure equals or exceeds the action level, but does not exceed the permissible exposure level (PEL).	Operator enrolls the miner in hearing conservation program (HCP) which includes (1) a system of monitoring, (2) voluntary, with two exceptions, use of operator-provided hearing protectors, (3) voluntary audiometric testing, (4) training, and (5) record keeping.
§ 62.130 ….	Miner's exposure exceeds the PEL	Operator uses/continues to use all feasible engineering and administrative controls to reduce exposure to PEL; enrolls the miner in a HCP including ensured use of operator-provided hearing protectors; posts administrative controls and provides copy to affected miner; must never permit a miner to be exposed to sound levels exceeding 115 dBA.
§ 62.140 ….	Miner's exposure exceeds the dual hearing protection level.	Operator enrolls the miner in a HCP, continues to meet all the requirements of § 62.130, ensures concurrent use of earplug and earmuff.

I. Reporting of Sampling Results - Coal

Within 30 calendar days from completion of the sample, the data on the Form 2000-84 must be entered into the Coal Noise Sampling Database at either the field office or the district office.

J. Reporting of Sampling Results - Metal/Nonmetal

1. Inspection reports must include a copy of the Health Field Notes, the completed Personal Exposure Data Summary (PEDS), citations/orders, photos, and any other supplemental information collected during the inspection.

2. When completing the PEDS (refer to Chapter 21, Section VIII), be sure that the percent dose and exposure level units of measurement match the contaminant code (refer to Chapter 21). Sound level meter readings used for screening purposes **<u>are not</u>** reported

on the PEDS, Area Sample Data Summary (ASDS), or the Inspection and Investigation (I&I) Data Summary. Record the SLM screen readings in the health field notes.

K. Determination of the Feasibility of Noise Controls

For a noise overexposure greater than or equal to 132% of the permissible dose a feasibility determination must be made ***prior*** to issuing a citation for lack of controls.

Feasibility = Technological and/or Administrative Achievability + Economic Achievability

Using PIB 04-18 (see Appendix 5), determine whether there are technologically or administratively achievable engineering and/or administrative noise controls, which when used either singly or in combination with other controls would lower the noise exposure by at least 3 dBA[1]; and, whether the cost of the controls would be wholly out of proportion to the reduction in noise exposure expected by their implementation. This 3 dBA equivalent reduction is in a miner's noise exposure, not in noise levels. Exposure (% dose) and sound level (Sound Pressure Level, dBA) are not synonymous terms because an exposure includes a time factor. In addition to providing at least a significant noise exposure reduction (3 dBA), the specific application of the noise control(s) must be technologically (or administratively) achievable and economically achievable for the unique conditions at the mine.

In most instances, this determination process is transparent and quite straightforward, i.e., technologically or administratively achievable controls exist, are at a reasonable cost in light of the expected noise exposure reduction, and therefore must be implemented. For example, the PIB 04-18 states that mufflers are technologically achievable controls for hand-held percussive tools. A reasonable estimate of the cost of the muffler is less than $500, a sum that is economically achievable for most, if not all, situations. In 1991, the Federal Mine Safety and Health Review Commission determined that it was feasible to retrofit a bulldozer worth approximately $20,000 with an air-conditioned cab estimated to cost $10,000 at a small sand and gravel operation with 3 employees. It was feasible since it was technologically and economically achievable.

In some cases, it will be necessary to seek supervisory guidance when making the decision whether to require a control. Consultation is strongly encouraged. Follow the district procedures for consulting with the field office supervisor, district staff, Division of Health or Technical Support staff for advice.

Part 62 considers administrative controls to be equivalent to engineering controls, however, both must be found feasible before they can be required to be implemented.

---

[1] A 3 dBA equivalent reduction in terms of an initial and final dose is equivalent to a 34% reduction in the initial dose. (If the final dose is 0.66% of the initial dose, or less, then a 3 dBA equivalent reduction has been achieved, i.e., Dfinal = Dinitial *0.66.)

The Process

1. Determine a miner's noise exposure using full-shift dosimetry. If the dose equals or exceeds 132%, an overexposure condition exists. ***Note: Do not issue a citation for lack of controls until a determination of feasibility is made.***

2. Record source(s) of noise overexposure in the notes and briefly describe the noise controls that have been installed or implemented and whether the controls are properly maintained.

3. Refer to PIB04-18 (see Appendix 5) for a list of controls. Determine which, if any, of the controls are technologically achievable or administratively achievable in this particular situation. Technologically achievable controls denoted as "conditional" should be reviewed and take into consideration the conditions that exist at the mine that could affect their effectiveness or create additional health or safety hazards.

4. If all technologically achievable engineering and administratively achievable administrative controls are determined to be properly selected, installed, used, and maintained, or there are none, do not issue a citation for lack of controls, rather, initiate the P-Code process. (See Appendix 6 , PIB 04-5, "Basis for Assigning a P-Code for Noise Overexposure.")

5. When there are technologically or administratively achievable controls which have not been implemented, determine whether the controls are economically achievable in this particular situation.

   a. A reasoned estimate of the cost of the control under consideration.
   b. The nature and extent of the noise exposure.
   c. A comparison of cost estimates for original equipment, replacement, retrofit, and/or repairs.
   d. Estimated costs of abatement would be reasonable to achieve benefits (i.e., reduction in a miner's noise exposure).

NOTE: Assistance in estimating costs will be available on MSHA's website.

6. If a technologically achievable or administratively achievable control is extremely costly for the operator but the expected reduction in noise exposure is minimal, it may be determined that it is not economically achievable for the operator to install the control.

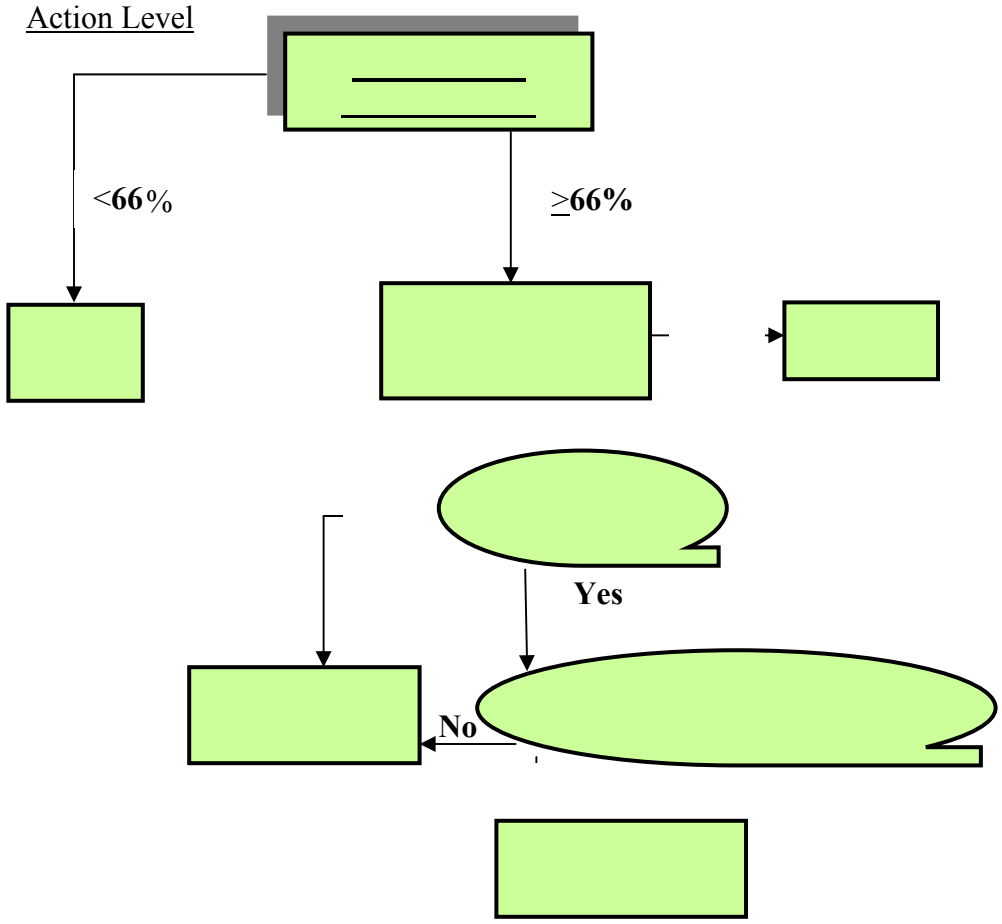
7. If a control is both technologically achievable or administratively achievable and economically achievable then it is feasible for implementation by the mine operator.

8. Once feasibility (economic and technological or administrative achievable) is established for controls not in place, then issue the citation for the overexposure and set an abatement period.

9. Once all feasible controls are implemented and sampling indicates continued overexposure, proceed to a P-Code. (See Appendix 6, PIB 04-5, "Basis for Assigning a P-Code for Noise Overexposure.")

L. Compliance Determination

1. Action Level



When a miner's exposure equals or exceeds the Action Level as defined in 30 CFR 62.101, but the miner's exposure does not exceed the PEL, a citation under 30 CFR 62.120 must be issued to the operator/contractor **IF** the results of a noise sample show that:

a. The full shift noise exposure of any miner is 66 percent or greater; **AND**

b. The affected miner(s) is/are not enrolled in a Hearing Conservation Program that complies with all elements of 30 CFR 62.150.

For an exposure equal to or exceeding the Action Level (TWA_8 of 85 dBA) up to the Permissible Exposure Level (TWA_8 of 90 dBA), hearing protection must be provided to the affected miner. However, for such exposures, the noise rule does not require miners to wear hearing protectors unless one of the following conditions exists:

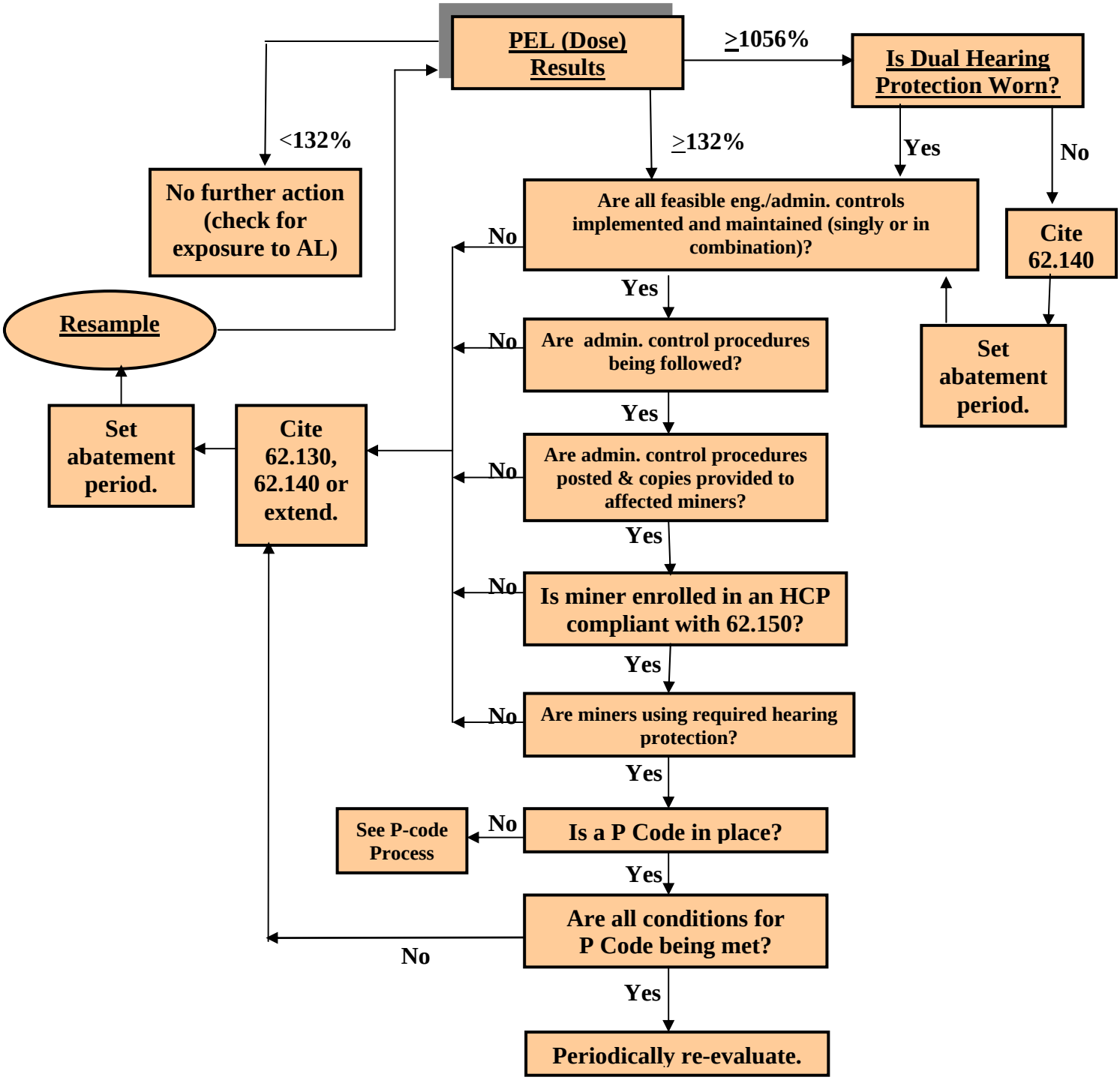
30 CFR 62.160(c) (1) – the miner has incurred a Standard Threshold Shift (STS); or

30 CFR 62.160(c) (2) – more than 6 months will elapse before a baseline audiogram is conducted.

Note: The citable level of 66 percent is based on the action level of 50 percent dose (TWA_8 of 85 dBA) plus an error factor of 2.0 dBA.

Note: 30 CFR 62.170 (2) – The mine operator MAY substitute the use of hearing protectors for the 14 hour quiet period before conducting audiometric testing. MSHA recommends that you strive to keep miner's noise exposures to below the Action Level of 85 dBA during the quiet period.

2. Permissible Exposure Level and Dual Hearing Protection Level, and Maximum Level (Refer to PEL chart shown below)



Determining whether a citation is warranted under 62.130 for exceeding the PEL, or whether a citation is warranted under 62.140 for exceeding the Dual Hearing Protection Level (DHPL), is a two-step process. The two steps are:

1. finding that a miner's full-shift noise exposure is 132% (or 1056% for DHPL) or greater. A dosimeter must be used for this finding; **AND**

2. finding that any one of the provisions of 62.130 or 62.140 have not been complied with (e.g., feasible engineering and administrative controls have not been installed or maintained; miners are not enrolled in a HCP; operator provided hearing protectors are not being worn; administrative controls are not posted on the mine bulletin board, copies have not been provided to affected miners or are not being followed; or any other element of the HCP is not followed).

When the permissible exposure level (PEL), dual hearing protection level, (DHPL) or maximum level as defined in 30 CFR 62.101 has been exceeded, do not issue a citation under 30 CFR 62.130 or 62.140 unless the full-shift noise exposure of any miner is 132 percent or greater: (1056% or greater for DHPL) **AND**

any one of the following conditions exists:

1. MSHA determines that all feasible engineering and administrative controls have **not** been implemented or maintained; or

2. administrative control procedures are **not** being followed; or

3. administrative control procedures have **not** been posted on the mine bulletin board and a copy provided to affected miners; or

4. the miner has **not** been enrolled in a hearing conservation program that complies with all elements of 62.150; or

5. miners are **not** wearing operator-provided personal protective equipment.

Miners **MUST WEAR** hearing protectors when their exposure exceeds the PEL **despite** the use of all feasible engineering and administrative controls. A citation issued for any of the criteria listed above must not identify the miner by Social Security number or the last 4 identifying digits of the miner's Social Security number. Identification should be made by section identification number, occupation code, or other data such as "right side roof bolter." A statement must also be included that personal hearing protection must be worn until the exposures are reduced to or below the PEL and/or dual personal hearing protection must be worn until the miner's exposure is reduced to or below the dual hearing protection level (DHPL). Where the action level has been met or exceeded, a statement indicating the elements of the Hearing Conservation Program that have not been implemented must be included in the body of the citation.

3. Citations and Orders

The operator will be cited separately for each overexposed miner. For example, at mills and preparation plants, where there are multiple noise sources, such as chutes, crushers, and screens, separate citations will be issued for each miner found to be overexposed. Likewise, at surface and underground mines where there are multiple noise sources such as bulldozers, loaders, haul trucks, etc., separate citations will be issued for each miner found to be overexposed.

However, if there is a single noise source causing an overexposure to numerous miners and its control would bring all exposed miners into compliance, then only one citation will be issued, provided all of the other requirements of the standard are met. The total number of miners overexposed will be indicated on a single citation. For example, one citation will be issued if an air track drill exposes both the driller and the drill helper to similar noise exposures above the PEL with the number of affected miners indicated on the citation.

For each miner found overexposed, a single citation of either 62.120, 62.130, or 62.140 will be issued with all other Part 62 provisions violated grouped as part of the citation. For example, if a miner's exposure exceeds the PEL and the operator failed to provide training and offer audiometric testing, a single citation of 62.130 will be issued and provisions of 30 CFR 62.150 that were violated will be stated in the body of the citation. Where a citation is pending abatement by either retiring or replacing a piece of equipment that is the source of noise, failure to maintain any controls implemented or to comply with requirements of 30 CFR 62.150 will result in a 104(b) order or a 104(a) citation. Where a mine has been assigned a "P"-code, failure to comply with any of the conditions of the "P"-code, including provisions of 30 CFR 62.150, will result in a separate citation for each miner affected. For example, if three miners exposed to the noise generated from a single piece of equipment that is covered by a "P"-code are observed not wearing hearing protection, three separate citations will be issued.

4. Noise Citation Examples

The following are examples that should be used as guidance when issuing citations:

a. Based on the results of an MSHA full shift noise sample taken on September 13, 2001, the continuous mining machine operator (036 occupation) working on the 2 South Section received a permissible exposure level dose of 170%. This exceeds the permissible exposure level of 100% plus error factor (or 132%).

The machine was a Joy 12CM-1 model, S/N 563852.

The operator was not wearing a hearing protector. A hearing protector must be provided and worn by the miner operating the continuous mining machine until the exposure is reduced to or below the permissible exposure level.

Section: 62.130(a)
Gravity: Reasonably Likely
Permanently Disabling
S&S

If the miner was wearing a hearing protector, cite:

Section: 62.130(a)
Gravity: Unlikely
Permanently Disabling
Non-S&S

b. Based on the results of an MSHA full shift noise sample taken on September 13, 2002, the laborer (XXX occupation) working in the XYZ Plant received a permissible exposure level dose of 1263%. This exceeds the dual hearing protection level of 800% plus error factor (or 1056%).

The miner was not wearing dual hearing protectors. Dual hearing protectors must be provided by the mine operator and its concurrent use ensured until the noise exposure is reduced to or below the dual hearing protection level. The initial abatement period is to allow time for the mine operator to provide and ensure the concurrent use of dual hearing protectors. After the dual hearing protection requirement is met, actions specified in 62.130 apply, for exposures that exceed the permissible exposure level.

Section: 62.140
Gravity: Highly Likely
Permanently Disabling
S&S

If the miner was wearing dual hearing protectors, cite:

Section: 62.140
Gravity: Unlikely
Permanently Disabling
Non-S&S

c. Based on the results of an MSHA full shift noise sample taken on September 13, 2003, the bulldozer operator (XXX occupation) working in the 001 pit received a noise dose of 84%. This exceeds the Action Level dose of 50% plus error factor (or 66%).

The bulldozer is a Caterpillar D-9 model, S/N 85Q65P2. The miner was enrolled into a hearing conservation program which does not comply with all provisions of 30 CFR 62.150. The provisions not complied include: (1) 62.170 Audiometric Testing and (2) 62.180 Training

The miner was not wearing a hearing protector.

Section:	62.120
Gravity:	Unlikely Permanently Disabling Non S&S

Adequate justification needs to be documented before any subsequent action is issued.

The latest version of the MSHA Citation and Order Writing Handbook contains additional examples of citations, extensions, and terminations for violations of the noise rule.

M. Violation Abatement Procedures

1. Upon issuance of a citation for a violation of 62.120, Action Level, the following abatement procedures must be followed:

a. The citation can be terminated when it is determined that the mine operator has enrolled the affected miner(s) in a Hearing Conservation Program that fully complies with all elements of section 62.150.

However, with respect to the audiometric testing provision, the citation can be terminated if the operator has conducted or **scheduled** a reasonable date for implementing audiometric testing, and all other elements of 62.150 are being complied with. This information must be included in the justification for action, when the citation is terminated.

If the operator then fails to **provide** the audiometric testing as scheduled, a full-shift noise sample must be conducted to ensure that the miner(s) is still exposed at or above the action level. If the miner(s) is still exposed at or above the action level, issue a citation under 62.120, stating in the body of the citation that audiometric testing was not provided. If circumstances warrant, this citation should reflect a higher degree of negligence and/or gravity and allow a reasonable abatement period.

If the mine operator fails to abate the citation within the abatement period, re-sample and if a citable action level exposure is found, issue a 104(b) order.

If a 104(b) order is issued, the affected miner(s) must be withdrawn from the "affected area" and the "affected area" portion of the order must list the miner's

location and occupation. The order cannot be lifted until compliance with all five elements of 62.150 has been achieved. Documentation outlining what actions were taken to terminate the citation is required.

b. A miner may be removed from the HCP when the miner's noise exposure has been reduced below the action level. If an operator is in the process of establishing an HCP but reduces miners' exposures below the action level prior to fully establishing and implementing the HCP, the operator is not required to complete the establishment and implementation of the HCP. However, if miners' exposures equal or exceed the action level at any time, the operator must establish an HCP and enroll affected miners.

Seasonal Operations Section

a. This paragraph applies to terminating citations for violations of the **action level (AL) at seasonal operations only**. When a citation is outstanding at a seasonal operation for equaling or exceeding the action level and it is infeasible for the operator to obtain an audiogram or complete training for affected miners before the mine shuts down, citations will be terminated when the mine operator has implemented all other aspects of the HCP and the operator provides a reasonable date for implementing the remaining elements of the HCP. The information must be included in the justification for action, when the citation is terminated. When the mine reopens, the operator must implement the remaining elements of the HCP, unless the operator has reduced the affected miners' exposures to below the AL.

b. If the operator has not implemented the remaining elements of the HCP, re-sample the affected miner. If the exposure still equals or exceeds the AL, issue appropriate citation (under 62.120), allowing a reasonable abatement period. If the mine operator fails to abate the citation within the abatement period and a full shift dosimeter sample indicates continuing non-compliance with the action level issue a 104(b) order.

Portable Operations Section

NOTE: When the operation or occupation under citation moves to a new location away from the initial mine site, follow procedure in the Citation and Order Writing Handbook [Ch.7, XI (B) (2)].

2. Upon issuance of a citation for a violation of 62.130, Permissible Exposure Level, the following abatement procedures must be followed:

a. The inspector **must** conduct a follow-up full-shift noise exposure sample upon expiration of the abatement time as originally set or extended if feasible noise controls have been implemented which may achieve compliance.

b. If the sample shows compliance:

(1) The citation must be terminated; and

(2) Documentation outlining what actions were taken to terminate the citation is required.

c. If compliance is not achieved and MSHA determines that additional feasible controls exist:

(1) Additional engineering and/or administrative controls are required to be installed or implemented to lower the miner's noise exposures further.

d. If compliance is not achieved and MSHA determines that all feasible engineering and administrative controls have been installed or implemented, and all other requirements of 62.130 have been met (e.g., feasible engineering controls are being maintained, miners are enrolled in an HCP that complies with all parts of 62.150, operator-provided hearing protection is being worn, and administrative control procedures are being followed, have been posted on the mine bulletin board and copies provided to affected miners):

(1). A P-code will be assigned for MSHA recordkeeping purposes;

(2) The citation will be terminated; and

(3) The termination language will reference the P-code minimum acceptable engineering and administrative controls and conditions in detail.

For violations of the permissible exposure level, a citation will not be terminated until the operator has complied with each of the following requirements:

(1). All feasible engineering and administrative controls have been implemented and maintained; and

(2). Administrative control procedures have been posted on the mine bulletin board, copies have been provided to affected miners, and the procedures are being followed; and

(3). Affected miners have been enrolled in an HCP that complies with **ALL** of section 62.150; and

e. If the mine operator fails to abate the citation within the abatement period, and an extension of the abatement period is not warranted:

(1) You must re-sample;

(2) If the overexposure is on-going, issue a 104(b) order; and

(3) If a 104(b) order is issued, the affected miner(s) must be withdrawn from the "affected area" and the "affected area" portion of the order must list the miner's location and occupation. Documentation outlining what actions were taken to terminate the citation is required.

3. Upon issuance of a citation for a violation of 62.140, Dual Hearing Protection Level, the following abatement procedures must be followed:

a. If the operator does not provide the miner with dual hearing protection within the **short** abatement period, and an extension is not warranted, issue a 104(b) order. If a 104(b) order is issued, the affected miner(s) must be withdrawn from the "affected area" and the "affected area" portion of the order must list the miner's location and occupation. Upon the abatement of the conditions or practices cited in the original citation the order can be terminated. Documentation outlining what actions were taken to terminate the citation is required.

b. After the miner is provided with dual hearing protection, the mine operator must continue actions to lower miners' exposures to the PEL, using the 90 dBA PEL dose. The citation should be extended to allow the mine operator time to comply with the requirements of 62.130.

c. The inspector **must** conduct a follow-up full-shift noise exposure sample upon expiration of the abatement time as originally set or extended if feasible noise controls have been implemented which may achieve compliance.

d. If it is found that the noise exposure has been reduced to or below the DHPL, but still exceeds the PEL, compliance with 62.130 must still be achieved before the citation can be terminated. (See PEL abatement procedure Section M.2.)

N. P-codes

1. Definition and Use

MSHA uses the letter "P" as an action code in its database to designate that an overexposure condition remains even though all feasible engineering and administrative controls are in place. Thus, a "P-code" is an administrative device that allows MSHA to track these special overexposure situations. There are two scenarios involving a miner's overexposure to noise where the use of a P-code would be appropriate:

a. <u>No Citation Issued</u>

MSHA determines that a miner's exposure exceeds the PEL.

1. All feasible engineering and administrative controls have already been put in place and are maintained **<u>and</u>**,

2. All affected miners are enrolled in a Hearing Conservation Program that complies with all elements of 62.150 **and**,

3. Hearing protection is being provided and worn **and**,

4. The mine operator has posted and provided affected miners with copies of any procedures for administrative controls being used.

No citation will be issued and the P-code review process will be initiated. (Appendices 2, 3 and 6).

b. Citation Issued

MSHA determines that a miner's exposure exceeds the PEL, and

1. All feasible engineering and administrative controls have not been implemented, or are implemented but not maintained; or

2. All affected miners are not enrolled in a Hearing Conservation Program that complies with all elements of 62.150; or

3. Hearing protection has not been provided or is not being worn; or

4. The mine operator has not posted or provided affected miners with copies of administrative controls being used.

A citation will be issued if the miner's exposure still exceeds the PEL. After the mine operator has complied with Part 62, the P-code review process will be initiated (Appendices 2, 3, and 6).

If either scenario exists, P-code documentation must be developed in accordance with the P-code Documentation Checklist (See Appendix 3). Documentation will be coordinated with the field office, district office, technical support and headquarters. Information will be obtained from the operator if it is needed.

This information will then be referred to the District Manager (DM) for a recommendation. If the DM believes a P-code is warranted, the DM reviews the situation in consultation with field enforcement staff, headquarters' officials, and MSHA technical experts. This review includes an evaluation of the circumstances surrounding the overexposure, with particular emphasis on assessing the feasibility and effectiveness of control options. (See Appendix 5.)

2. Assignment of a P-code

If MSHA determines that a P-code is warranted, it will be assigned to the miner's occupation. **P-codes ARE NOT ASSIGNED TO SPECIFIC PIECES OF MINING EQUIPMENT OR AREAS OF THE MINE.** The assigned P-code will be transmitted to the mine operator through the District Manager. All P-codes will be identified by a tracking number.

If a P-code is assigned, the mine operator must continue to abide by the requirements in 62.130 and the minimum acceptable engineering and administrative controls and conditions specified in the P-code assignment or citation termination documentation.

District offices will assure that periodic review of the P-code determines that the minimum acceptable engineering and administrative controls and conditions specified are being followed. P-codes can be rescinded if a full shift sample has been taken and,

a. the operator fails to comply with the specified minimum acceptable engineering and administrative controls and conditions; or

b. the sample demonstrates that the operator has reduced miners' exposures to or below the PEL; or

c. new feasible technology becomes available and the mine operator refuses to implement the technology; or

d. any of the requirements of 62.130 are not complied with.

QUEST Q-200/300 OPERATING PROCEDURES

A. BATTERY CHECK

1. Turn the dosimeter on by pressing the **MENU/ON/OFF** key. After counting down, the display will read **"ON"** and **"PAUSE".**

2. Assure that the **"LOBAT"** indicator is not visible in the display. If it appears, you have less than 8 hours of battery life and it should be replaced. **MAXIMUM** – Two Samples per Battery.

****NOTE**RESET INSTRUMENT TWICE AFTER INSTALLING NEW BATTERY.**
(Failure to do this may result in lost samples.)

a. The instrument will turn on automatically when a new battery is inserted.
b. Reset the instrument following Section B1-B3 below.
c. Turn the dosimeter off by pressing and holding the **MENU/ON/OFF** key until the screen clears.
d. Turn the dosimeter back on and follow Section B1-B3 below.

B. RESETTING THE INSTRUMENT – CLEARING STORED DATA

****NOTE**THIS MUST BE DONE PRIOR TO EVERY SAMPLE AND WILL ERASE ALL PREVIOUSLY STORED DATA IN THE UNIT**

1. With the unit on, press and release the **MENU ON/OFF** key until **"rES5"** is displayed.
2. Press and hold the **ENTER** key for 5 seconds as **"rES5"** counts down to **"rES1".** Release the button when the display shows "----"and the display will show **"ON"** and **"PAUSE".**
3. The data in memory will be cleared.
4. The unit is ready for calibration or to be turned off for later use.

C. PRE-SAMPLING CALIBRATION

1. Turn the dosimeter on, if not already on, by pressing the **MENU ON/OFF** key.
2. To calibrate, with the unit in **"ON"** and **"PAUSE"** mode, press and release the **ARROW UP** ▲key. The display will show **"114.0 CAL".**
3. Turn on the calibrator and carefully place the microphone into the adapter ring.
4. Press **RUN/PAUSE** key. The display will show **"CAL"** then **"PASS"** then **"114.0 CAL"** when complete. If calibration fails, **"FAIL"** will appear in the display. The unit must be turned in for repair.
5. Press the **MENU ON/OFF** key to exit calibration mode. The unit is now ready for a noise sample or to be turned off for later use. Record the **"PASS"** in your notes.

****NOTE**The windscreen should be used to conduct a VALID noise sample.**

D. CONDUCTING A NOISE SAMPLE

1. Turn dosimeter on, if not already on, by pressing the **MENU ON/OFF** key. The display will read **"ON"** and **"PAUSE**".
2. Press the **RUN/PAUSE** key to begin the sample. The display reads **"ON"** and **"RUN".**
3. Replace the cover and put the dosimeter on the miner.
4. Press the **RUN/PAUSE** key to end the sample. The display reads **"ON"** and **"PAUSE".**
5. Data Retrieval.
   (a) If results will be retrieved when you return to the office, the instrument may be turned off. The data will be stored in memory until cleared using **Section B**. **GO TO Section E1.**
   (b) It is preferable for results to be retrieved at mine site, **GO TO Section E2**.

E. OBTAINING THE SAMPLE RESULTS

"I" = DOSIMETER I = 85dBA ACTION LEVEL
"II" = DOSIMETER II = 90dBA PERMISSIBLE EXPOSURE LEVEL (PEL) AND 90 PEL MAX

1. Turn on the instrument, if not already on, by pressing the **MENU ON/OFF** key. The display will read **"ON"** and **"PAUSE".**
2. The **Total Sample Time** is obtained by pressing the **TIMES** key.
3. Press **ARROW UP ▲or ARROW DOWN ▼**key until **"RT" (Run Time)** is displayed.

   Ensure the readings obtained in the following step are NOT "PT"**(Pause Time)** or "UL**" (Upper Limit Time). Use either Dosimeter I or II. The time will be the same.**

4. The number of hours is displayed as **"XX:hr".** Press **ARROW UP ▲or ARROW DOWN▼** key until the number of minutes and seconds is displayed as **"XX:XX".** Record Total Sample Time in notes/form.
5. Press the **DOSE** key until **Dosimeter "I"** is displayed. Record the **85 Action Level Dose** in notes/form.
6. Press the **DOSE** key until **Dosimeter "II"** is displayed. Record the **90 PEL Dose** in notes/form.

Note: Dosimeter I Dose will always be greater than Dosimeter II Dose.

7. **For Coal**, Press the **"LEVELS"** key then press the **ARROW UP ▲or ARROW DOWN ▼**until **"MAX"** is displayed. Record the **90 PEL Max** under item **"X"** on 2000-84. (use no decimals ex 123.9 = 123 dBA).
8. **For Coal**, Press the **"TIMES"** key then press the **ARROW UP ▲or ARROW DOWN ▼**key until **"UL"** is displayed. Follow STEP 4 above and record the **UCL (Upper Control Limit)** Time in minutes under item "Y" on Form 2000-84.
9. Press the **AVG** key until Roman numeral **"I"** is displayed. Press **ARROW UP ▲** key until **"TWA"** is displayed on the left. Write the number in the Health Field Notes. Press **AVG** key once and record **TWA** reading for Roman Numeral **"II"** in Health Field Notes. (The TWA dBA value is the same as Table 62-2 and must be included in the body of the citation if there is an overexposure.)

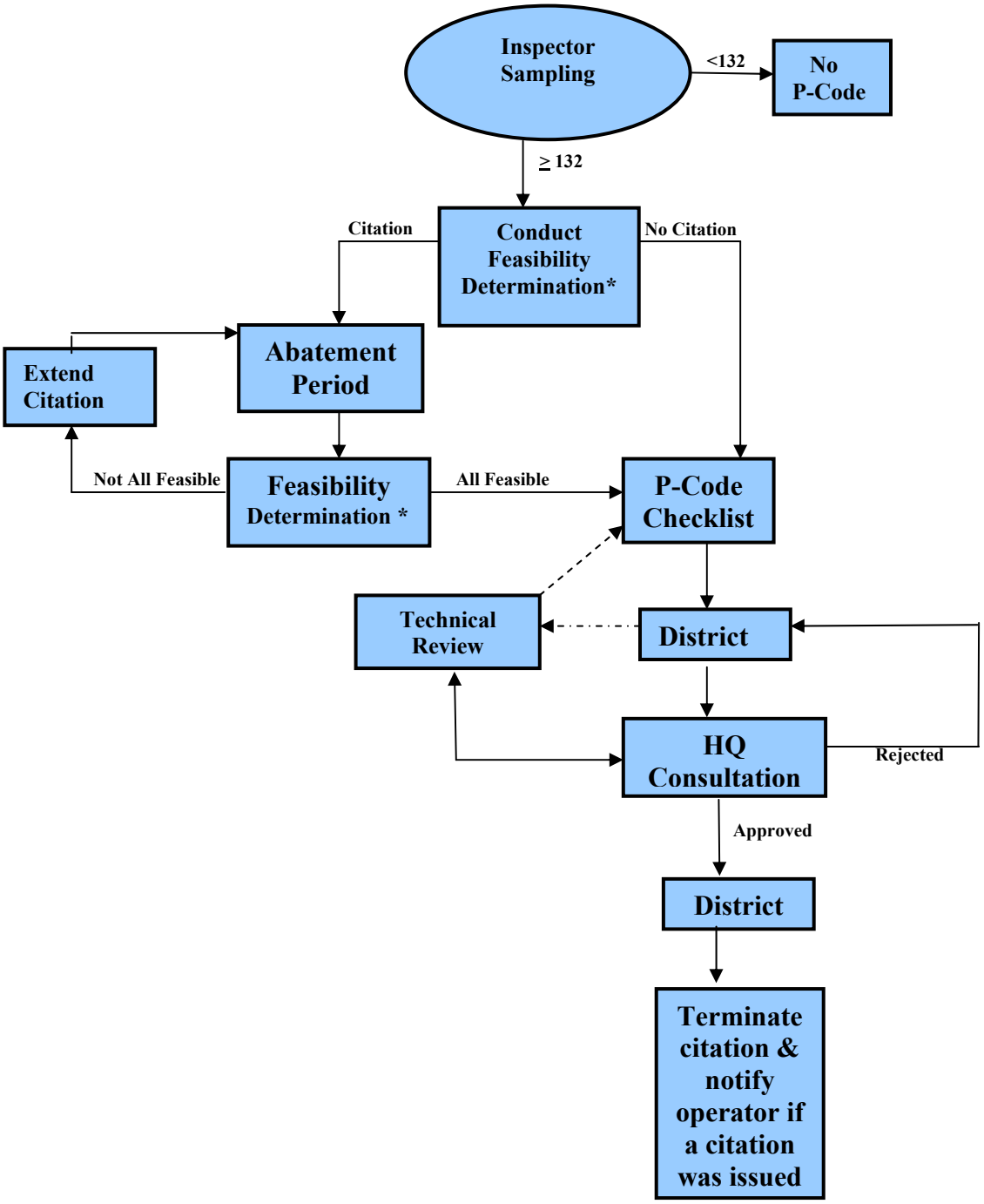
F. <u>POST SAMPLING CALIBRATION CHECK</u>
Use same calibrator for pre and post checks

1. Press the **MENU ON/OFF** key to exit Section E instructions or to turn unit on, if not already on.
2. Turn on the calibrator and carefully place the microphone in the adapter ring.
3. Press the **LEVELS** key until **Dosimeter "I" or "II"** Is displayed.
4. Press the **ARROW UP ▲**or **ARROW DOWN ▼**key until **"SPL" (Sound Pressure Level)** is displayed.
5. The display should read **"114.0"** within +/- 1.0 dBA. If not, the sample results are not valid. Document the validated 114 dBA SPL value.

Remove battery between sampling.

APPENDIX 2

P-Code Process



* Determine that all other parts of 62.130 have been met.

APPENDIX 3

P-Code Documentation Checklist

P-code Number _____
Date _____
District & Field Office _____
District Contact _____
Operator/Contractor Name and I.D. No. _____

ITEM	a	b	DOCUMENTATION
A.			**What is the origin of the P-code request?** a) Mine inspector request based on a citation b) Mine inspector request without a citation
ITEM	**YES**	**NO**	**Information for Items B – I to be provided**
B.			**Is a brief narrative describing the operation and working conditions that resulted in an overexposure included?** If so, please attach.
C.			**Are there occupational / tasks details such as:** What is the occupation(s)? What is the job / occupation code(s)? What is the occupation description? Please provide a full description of tasks involved with the miner's work.
D.			**Is the noise overexposure linked to a discrete piece or pieces of equipment?** If yes, is the following information listed for each piece of equipment? a) Manufacturer's name b) Manufacturer's address c) Manufacturer's telephone number d) Type and model of machine e) Year Manufactured f) Serial Number Is the noise overexposure linked to a specific area(s) of the mine? If so, list the area(s) and note why there is a concern.

E.			**Is a description and effectiveness of the engineering controls currently being used included?**
F.			**Is a description of engineering controls considered, but not used, included?** Are reasons included why the engineering controls were not used and /or considered infeasible?
G.			**Is a description and effectiveness of the administrative controls currently being used included?**
H.			**Is a description of administrative controls considered, but not used, included?** Are reasons included why the administrative controls were not used and /or considered infeasible?
I.			**Are any consultant's reports included with operator documentation?** If yes, are the following included? a) Test data and results b) Recommendations and conclusions
			Information for Items J – O to be provided by MSHA District
J.			**Has a citation been issued?** If yes, has the following information been provided and/ or conditions met? a) Citation b) Citation Extensions c) Inspectors field notes d) Compliance has not been achieved Is the citation based on: a) All feasible engineering and administrative are not in place b) Operator-provided hearing protection is not being worn by miners c) Affected miners are not enrolled in a HCP d) Administrative control procedures are not posted on the mine bulletin board or affected miners have not been provided a copy of administrative control procedures **If no citation has been issued, then have the following conditions been met?** a) Noise sampling indicating exposure > PEL b) All feasible engineering and administrative controls in place/maintained c) Copy of administrative control procedures posted and provided to all affected miners d) All affected miners enrolled in a compliant Hearing Conservation Program that meets all the aspects of 62.150 e) Operator-provided hearing protection has been provided and is being worn by miners.

K.			**Has Technical Support been involved?** If yes, is the report/recommendations attached? If no, are there Technical Support reports available on this class of equipment? Has Technical Support provided consultants' reports obtained from other sources?
L.			**Has the Team been involved?** If yes, are the report / recommendations attached?
M.			
N.			**Noise Data** Has a Q-300 noise dosimeter sampling been conducted and attached? Have sound level readings been taken and included? If yes, what format? Table ___ Sketch ___ Other ___ What was the overexposure reading determined by MSHA sampling?
O.			**District Approval** Has a cover memo been included from the District Manager requesting a P-code?
			Item P for Headquarters use
P.			**Does the report provide the needed information to evaluate the P-Code request?** If no, list the deficiencies. If yes, what is the final determination and conditions for the P-code?
Q.			**Administrator's Action** Has the Administrator sent a memo to the District advising of the P-code determination, conditions and number? If no, why not?

Appendix 4

CMS&H Noise Report

U.S. Department of Labor

Mine Safety and Health Administration

A. Mine ID/Contractor ID Number	B. Event Number	C. AR Number	D. Office Code	E. Survey Date (Mo Day Year)	F. Activity Code
– –					

G. Mine Name	H. Company Name

I. Survey Sample Number	1			2			3			4			5			6		
J. Survey Type	Initial	Follow-up		Initial	Follow-up		Initial	Follow-up		Initial	Follow-up		Initial	Follow-up		Initial	Follow-up	
K. P-Code																		
L. MMU/Pit/Area Surveyed																		
M. Instrument Property Number																		
N. Calibrator Property Number																		
O. Miner's Last Name/First Initial																		
P. Occupation Code																		
Q1. Machine Code/Q2. Scrubber (Y or N)																		
R. Manufacturer's Code																		
S. Time Start (24 Hr. Clock)																		
T. Total Survey Time (Minutes)																		
U. Production this Shift																		
V. 85 Action Level Dose (Dosimeter I) (no decimals)																		
W. 90 PEL Dose (Dosimeter II) (no decimals)																		
X. 90 PEL Max (no decimals)																		
Y. UCL (117 dBA) Time (Minutes)																		
Z. Calibration Check (Y or N)	Before	After		Before	After		Before	After		Before	After		Before	After		Before	After	
AA. Type of PHP	Muff	Plug	Cap	Muff	Plug	Cap	Muff	Plug	Cap	Muff	Plug	Cap	Muff	Plug	Cap	Muff	Plug	Cap
AB. Enrolled in HCP (Y or N)																		
AC. Citation Number																		
AD. Citation Abatement Code																		

AE. Comments/Abatement Action

Manufacturer Codes	
001	Abex
002	Acker
003	Acme
004	Advance Mining
005	Aerodyne
006	Allen-Sherman-Hoff
007	Allis-Chalmers Bulldozer & Fiat
008	Alpine
009	American Hoist
010	Atlas-Copco
011	Baldwin-Lime-Hamilton
012	Barber-Greene
013	Betti
014	Black & Decker
015	Bucyrus-Erie (BE)
016	Buffalo-American
017	Case
018	Caterpillar (cat)
019	Cedar Rapids
020	Chevrolet
021	Chicago Pneumatic
022	Clark
023	Cline
024	Coeur d'Alenes
025	Cushman
026	Dart
027	Demag
028	Deutz
029	Dorr-Oliver
030	Dravo
031	Eaton
032	Eickhoff
033	Eimco
034	Elkhorn
035	Emaco
036	Epling
037	Euclid (uke)
038	Fairchild
039	Fletcher
040	FMC & Link Belt

Manufacturer Codes	
041	Ford
042	Fuller
043	Galis FM Calso
044	Gardner-Denver
045	General Electric
046	GMC (Jimmy)
047	Goodman
048	Gorman-Rupp
049	Gradeall
050	Grundlach
051	Harnischfeger & P&H
052	Hewitt-Robins
053	Ingersol-Rand
054	Insley
055	International Harvester (IH)
056	Jeffrey-Dresser
057	Jold
058	Joy
059	Kenworth
060	Kersey
061	Kobota
062	Koehring
063	Komatsu
064	Kress
065	Krupp
066	Lee-Norse
067	Long-Airdox
068	Mack (bulldog)
069	Manitowoc
070	Marion
071	Marathon Le Tourneau
072	Massey-Ferguson
073	McLanahan
074	Mescher
075	Michigan
076	Mine Equipment Co.
077	Mining Progress Inc.
078	Myers-Whaley
079	Nagle
080	National Mine Service

Manufacturer Codes	
081	Nolan
082	Nordberg & Rexnord
083	Northwest
084	Orenstein & Kopper
085	Oshkosh
086	Owens
087	Page
088	Penndrill
089	Pioneer
090	Plymouth
091	Raygo
092	Richmond
093	Ripco
094	Robbins
095	Rosco
096	Royal
097	Salem
098	S & S
099	Schramm
100	Schroder
101	Stacy
102	Stamler
103	Symons
104	Telsmith
105	Terex
106	Unit Rig Equipment Co.
107	Universal
108	Wabco
109	Wagner
110	Warner Swessey
111	Westfalia
112	Westinghouse
113	White
114	Wilcox
115	Wilfley
116	Winter-weiss
117	Wirth
118	Yale
119	Not on this list
120	Unknown

Abatement Codes	
01	Engineering
02	Administrative
03	Combination
04	Removal of Equipment/Mine
05	Other

Equipment Codes	
01	Air Compressor
02	Auger Miner (UG or S)
03	Bulldozer
04	Classifer, Cyclone
05	Coal, Face Drill
06	Continuous Miner (ripper)
07	Continuous Miner (borer)
08	Conveyor (all types)
09	Crane (all types)
10	Crusher, Breaker
11	Cutting Machine
12	Dragline
13	Dredge
14	Elevator, Hoist
15	Fan (fixed or auxiliary)
16	Floatation & Filters
17	Forklift
18	Front End Loader, Highlift
19	Gunite Machine
20	Hand Tolls
21	Highwall Drill
22	Hydraulic Jets
23	L - H - D (surface)
24	Loading Machine
25	Locomotive (UG or S)
26	Longwall Plow
27	Longwall Shear
28	Roadgrader
29	Rockdusting Machine
30	Roof Bolting Machine
31	Rotary Bucket Excavator
32	Rotary Dump
33	Scraper, Pan
34	Screen
35	Shovel (not dragline)
36	Shuttle Car (diesel)
37	Shuttle Car (electric)
38	Tractor, Scoop
39	Truck
40	Not on this list

DA Codes	
001-0 to 099-0	UG MMU Identification Number
100-0 to 199-0	UG Track Haulage
200-0 to 299-0	UG Belt Area
300-0 to 399-0	UG Trackless Haulage
400-0 to 499-0	UG Shops
500-0 to 599-0	UG Section Dumping Point
600-0 to 699-0	UG Rotary Dumps and Crushers
700-0 to 799-0	UG Miscellaneous
800-0 to 899-0	UG Intake Air
900-0 to 999-0	UG Roof Bolters

DWP Codes	
001-0 to 099-0	Surface Mine
900-0 to 999-0	Surface Area of UG Mine

Other Location Codes	
U01	UG Travelways and Haulageways
U02	UG Shafts and Slopes
U03	UG Offices, Lunchrooms, Storerooms
U04	UG General (non-DA outby of areas)
U05	UG Construction
S01	Surface Roads (haulage, access, other travelways)
S02	Dredges or Barges
S03	Impoundments, Ponds, or Refuse Piles
S04	Surface Load-in/out, stockpiles, transfer points)
S05	Surface Shops
S06	Surface Offices, Lunchrooms, Storerooms
S07	Surface General (works in a number of areas)
S08	Surface Construction
F01	Plant or Facility; Crushing or Grinding
F02	Plant or Facility; Washing and Screening
F03	Plant or Facility; Drying and Roasting
F04	Plant or Facility; Load-in/out, stockpiles, transfer points)
F05	Plant or Facility; Shops
F06	Plant or Facility; Offices, Lunchrooms, Storerooms
F07	Plant or Facility; General (works in a number of areas)
F08	Plant or Facility; Flotation and Reagent Areas
F09	Plant or Facility; Pelletizing
F10	Plant or Facility; Bagging or Packaging
F11	Plant or Facility; Construction
L01	Laboratories

Appendix 5

U.S. Department of Labor

Mine Safety and Health Administration
1100 Wilson Boulevard
Arlington, Virginia 22209-3939

ISSUE DATE: 08/02/2004

PROGRAM INFORMATION BULLETIN NO. P04-18

FROM: RAY McKINNEY
Administrator for
Coal Mine Safety and Health

ROBERT M. FRIEND
for Administrator for
Metal and Nonmetal Mine Safety and Health

MARK E. SKILES
for Director of Technical Support

SUBJECT: Technologically Achievable, Administratively Achievable, and Promising Noise Controls (30 CFR Part 62)

Scope

This Program Information Bulletin (PIB) applies to all Mine Safety and Health Administration (MSHA) enforcement personnel, equipment manufacturers, coal, metal, and nonmetal mine operators, independent contractors, miners, miners' representatives, and other interested parties.

Purpose

The purpose of this PIB is to provide guidance to operators, miners, miners' representatives, contractors, and equipment manufacturers on technologically and administratively achievable engineering and administrative noise controls. This document also identifies those engineering and administrative noise controls which offer *promise* for further investigation.

Information

The performance-oriented noise standards in 30 CFR Part 62 equate administrative and engineering controls and require that, when a miner's noise exposure exceeds the permissible exposure level (PEL), all feasible engineering and administrative controls be utilized to reduce the miner's exposure to the PEL. A feasible control is one that is both technologically (or administratively) and economically achievable. If such controls fail to reduce exposure to the PEL, personal protection equipment must be provided and used. These standards do not permit the use of personal protection equipment in lieu of feasible

engineering or administrative controls. A technologically or administratively achievable control or a combination of controls which achieves at least a 3 dBA reduction in a miner's noise exposure is considered significant, even if it fails to reduce the miner's exposure to the PEL. "If a miner's noise exposure continues to exceed the PEL despite the use of all feasible engineering and administrative controls, the mine operator must continue to use the engineering and administrative controls to reduce the miner's noise exposure to as low a level as is feasible." (30 CFR Part 62.130(b)).

This PIB describes technologically achievable and promising controls for several types of machinery used in mines. Many of the controls listed in Section One are in use throughout the mining industry and have been referenced by MSHA in prior noise control documents. This PIB also provides guidance on taking a practical approach to reducing miners' exposure to noise. Section Two of this PIB is a checklist of simple, straightforward ways to control noise exposure. Examples of administrative controls are provided in Section Three of this PIB. MSHA's Noise Enforcement Policy states that labor/management agreements will not be affected by the noise standard. MSHA will not require an operator to hire additional miners in order to "exhaust" all feasible administrative controls.

For purposes of this PIB, MSHA limits use of the term "technologically achievable" to engineering controls. MSHA is mindful that this term is conventionally used to describe controls or devices that are mechanical in nature, rather than controls that reduce a miner's noise exposure by actions such as adjusting work practices, rotating miners, rescheduling tasks, or modifying work activities. For this reason, this PIB refers to certain administrative controls as "administratively achievable," rather than "technologically achievable." As with those controls denoted as "technologically achievable," use of the term "administratively achievable" to describe these administrative controls is solely intended to clarify that MSHA generally considers them to be capable of being done, executed, or effected, and not that it is necessarily economically achievable to do so.

Administratively and Technologically Achievable Noise Controls

Administratively and technologically achievable noise controls have demonstrated effectiveness either singly or as part of a suite of noise controls under actual mining conditions and are known to reduce sound levels and miner noise exposure in most cases. These controls:

1. Reduce sound levels or exposure time, as demonstrated in widespread application on similar types of equipment operating as part of similar mining methods, or alternatively demonstrated as part of a scientifically designed study in which the results can be generalized;
2. Reduce the noise exposure (3 dBA when used either singly or in combination) of miners performing the usual duties associated with the mining method and equipment, and based on measured miner doses; and

3. An engineering control does not necessarily have to be pre-fabricated or off-the-shelf, but it must have a realistic basis in present technology.

It is possible that unusual characteristics of the equipment, the mine, or the application could result in the inability of a technologically achievable control to reduce miner noise exposure, but it is unlikely. As with all technological achievability determinations, when these situations are encountered they will be evaluated on a case-specific basis. Some controls are technologically achievable, but only when used in more limited circumstances. These controls are considered conditional because they may work in some situations, and may not work in other settings; i.e., the case-by-case rationale. Some reasons for denoting a technologically achievable control as "conditional" would be:

1. Its effectiveness is dependent on the conditions that exist at the minesite; or
2. The installation and use of the control may create a collateral health or safety hazard, which must be addressed.

Case-by-Case Feasibility Determinations

Recognizing that "one-size does not fit all," MSHA will evaluate circumstances on a case-by-case basis to determine the achievability (technological or administrative and economic) of a listed control. Due to the large variety of mining equipment, mining methods and environmental conditions in mines, there may well be circumstances in which a described control is not technologically achievable for a specific application.

Promising Controls

Technologically and administratively promising (*promising*) noise controls offer potential for noise reduction by having demonstrated effectiveness but may lack evaluation and/or documentation in terms of significant reduction of a miner's noise exposure either singly or as part of a suite of noise controls. Technologically promising controls are being developed or studied by manufacturers, industry, and government. Some controls in this class have real potential and mine operators or equipment manufacturers may want to consider participating in cooperative research studies to further evaluate these controls. In general, promising controls:

1. Have potential for reducing sound levels or exposure time based on laboratory or limited field studies;
2. Have potential to reduce miner noise exposure based on time studies of miners performing the usual duties associated with the mining method and equipment; and
3. May require further development, refinement, study or research.

MSHA and others will further evaluate their demonstrated effectiveness during in-mine production usage and MSHA will make updated information available.

Other Considerations

While MSHA believes the listed controls are currently the most effective in reducing miner noise exposure, mine operators are not restricted in their selection of controls to those technologically and administratively achievable controls described in this document. They may use other administrative and engineering controls to comply with MSHA's noise standard. We encourage the mining industry to share information regarding controls that have been implemented and found to be successful in reducing a miner's exposure to noise. Please contact MSHA's Directorate of Technical Support to provide information about noise control advances in the mining industry. This PIB will be updated as additional technologies and controls become available.

Section One
Descriptions of Technologically Achievable, Administratively Achievable, and Promising Noise Controls

Introduction

MSHA considers the engineering and administrative controls contained in this Program Information Bulletin (PIB) to be **technologically or administratively achievable** or to offer *promise* as noise controls which, when used either singly or in combination, have a demonstrated effectiveness or potential for achieving compliance with the PEL or for reducing a miner's noise exposure by at least 3 dBA. MSHA and others are further evaluating the demonstrated effectiveness of promising controls during in-mine production usage and updated information will be made available.

While the noise controls compiled in this PIB are on a machine/equipment basis, MSHA's noise standards are occupational exposure standards, not equipment-based standards. Compliance with the noise standard is determined by the miner's personal exposure and not the sound levels generated by the piece of equipment. Therefore, the miner's total noise exposure should be examined from an occupational viewpoint and not solely on a machine or equipment basis. All sources/tasks that generate noise must be identified and considered when determining appropriate noise controls and their effects. Engineering and administrative noise controls should be applied to those occupational noise sources and tasks that will yield a significant reduction in the miner's total noise exposure. For example, noise sources of 85 dBA or less should not require attention, especially when a competing noise source is at a much higher level.

The implementation of retrofit noise controls involves the use of individual devices, systems and/or materials designed for the specific purpose of reducing noise. Acoustical devices include, but are not limited to, cabs, enclosures, barriers, mufflers, and silencers which decrease sound levels to which the miner is exposed, or other electro-mechanical or video systems which reduce the amount of time miners are exposed to excessive noise.

Acoustical materials can reduce noise either by absorbing or blocking sound waves, or damping vibrations. These materials are generally referred to as absorption, barrier, damping, and composite materials, and they can substantially increase the effectiveness of other noise control devices. Selection of appropriate acoustical materials must be made based on a firm noise control engineering basis and commensurate to the task, properly installed, used, and maintained. Also, mine operators should be aware of the flammability properties of acoustical materials and, prior to application, should consider MSHA's flammability guidelines. These guidelines can be obtained by contacting MSHA's Directorate of Technical Support, Approval and Certification Center.

In general, a noise control device specified by the original equipment manufacturer (OEM) and available for a specific piece of equipment will yield better results than one subsequently constructed by the mine operator, a third party or rebuild shop. However, much success in the mining industry in reducing sound levels has been realized through the design, production, installation, and use of noise controls developed by third party after market sources or individual mine operators. In the case of non-OEM noise controls, a detailed investigation and evaluation should be conducted on the machine or the environment to identify noise sources. This should be followed by the development of detailed instructions and specifications for the selection of appropriate acoustical materials and for the construction, fabrication, and installation of equipment-based noise controls.

Engineering noise controls are effective when they are properly selected, installed, used, and maintained. Care should be taken in their selection such that they are appropriate to the equipment design, and do not have a harmful effect on the operation or performance of the machinery on which they are installed. Hazards caused by the application of engineering noise controls should be addressed to minimize the effects on a miner's health and safety.

For the purposes of this PIB, an "environmental cab" or "environmental booth" includes the structure plus the application and installation of appropriate acoustical materials to the inside areas of the cab or booth (e.g., absorption materials, composite materials or acoustical floor mat), and an appropriate air filtration/air conditioning system. A "skin kit" is a sectionalized cab (e.g., a 4-section metal cab without acoustical materials) that is attached to the roll-over protection system (ROPS)/falling object protection system (FOPS) on a piece of mobile surface equipment. Prior to implementing and attaching such a device, guidance from the ROPS and FOPS manufacturers should be obtained so as not to void any structural certification.

This PIB contains a list of controls for the following equipment:

1. Air Arcing
2. Air-Actuated or Air-Operated Cylinders
3. Augers - Surface
4. Auxiliary Ventilation Fans
5. Car Shakers and Rotary Dumps
6. Channel Burners
7. Continuous-Mining Machines / Augers / Loaders (Underground)
8. Diesel - Locomotives
9. Diesel - Underground Diesel-Powered Equipment
10. Draglines, Shovels and Cranes Not Equipped with Operator Cabs
11. Draglines, Shovels and Cranes Equipped with Operator Cabs
12. Dredges and Associated Equipment
13. Drills – Jumbo Drills

14. Drills – Truck Mounted/Blast Hole/Air Track
15. Hand-Held Percussive Tools
16. Longwalls
17. Mantrips
18. Mills / Processing Plants / Coal Preparation Plants (including Breakers at Anthracite Mines)
19. Mobile Equipment - Surface
20. Portable Crushers / Screening Plants and Associated Equipment
21. Roof Bolting Machines
22. Scalers
23. Stone Saws

1. Air Arcing

Air arcing is a major tool used in bucket maintenance on draglines and other similar equipment. A welder's noise exposure depends on the amount of time spent using the air arcing equipment during the work shift. MSHA considers the following administrative noise controls, or a combination of these controls, to be **administratively achievable** in reducing the noise exposure of miners engaged in air arc welding:

- **Limit the duration of air arc welding per shift;**
- **Rotate welding personnel; and**
- **Avoid side-by-side air arc welding.**

Other noise controls that offer *promise* when there would be a need for the use of air arcing include:

- *Reduction of air pressure to the minimum;*
- *Use of constant current air arc welding/gouging techniques at the lowest effective current and air pressure;*
- *Use of constant voltage air arc welding/gouging techniques at the lowest effective voltage and air pressure; and*
- *Use of alternate rods (certanium and cronatron gouging rods) or a plasma torch with a gouging tip (these methods may be appropriate only in specific applications).*

2. Air-Actuated or Air-Operated Cylinders

MSHA considers the following engineering noise controls, or a combination of these controls, to be **technologically achievable** and effective in reducing the noise exposure of miners working around air-actuated or air-operated cylinders:

- **Mufflers on exhaust outlets/ports;**
- **Hose extension on exhaust ports; and**
- **Enclosures.**

MSHA considers the following engineering noise control to be conditional:

- **Barriers.**

3. Augers - Surface

MSHA considers the following engineering noise controls, or a combination of these controls, to be **technologically achievable** in reducing the noise exposure of miners operating or working around surface augers:

- **Environmental cabs that include appropriately selected, correctly installed, and properly maintained acoustical materials (see Section One Introduction) applied to internal surfaces; and**
- **Exhaust mufflers and redirection of exhaust.**

MSHA considers the following engineering noise control to be conditional:

- **Appropriately selected, correctly installed, and properly maintained acoustical materials (see Section One Introduction) in the operator's compartment and the engine compartment.**

The following engineering noise control offers *promise*:

- *Barrier between the engine and the operator.*

4. Auxiliary Ventilation Fans

MSHA considers the following engineering and administrative noise controls, or a combination of these controls, to be **technologically and administratively achievable** in reducing the noise exposure of miners working around auxiliary ventilation fans:

- **Silencers matched to the fan;**
- **Barriers or enclosures for work areas to minimize occupational exposures;**
- **Locate fans away from areas where miners spend a significant amount of time;**
  and
- **Clean and maintain fan silencers on a regular basis.**

MSHA considers the following engineering noise control to be conditional:

- **Good maintenance practices, such as sealing air leaks and wrapping of ventilation tubing joints.**

The following controls offer *promise* in reducing the exposure of miners who may be in the vicinity of auxiliary ventilation fans:

- *Flexible connections between the fan and ventilation tubing;*
- *Install damping materials on tubing and fan blades; and*
- *Line several tube sections with appropriately selected, correctly installed, and properly maintained acoustical materials at the inlet side of the fan on an exhausting face ventilation system.*

5. Car Shakers and Rotary Dumps

Car shakers and rotary dumps are used to empty railroad cars containing coal or other materials. On a car shaker, electromagnets attach to the top of the car and vibrate the car so that the material falls out the bottom. A rotary dump grasps the car and rotates it, emptying it from the top.

MSHA considers the following engineering noise controls, or a combination of these controls, to be **technologically achievable** in reducing the noise exposure of miners working around car shakers or rotary dumps:

The following **technologically achievable** control is available for car shakers:

- **Operator environmental control booth that includes "appropriate acoustical materials" (see Section One Introduction) applied to internal surfaces.**

The following **technologically achievable** controls are available for rotary dumps:

- **Operator environmental control booth that includes "appropriate acoustical materials" (see Section One Introduction) applied to internal surfaces; and**
- **Radio remote controls installed to position the operator away from the dump.**

The following controls may hold *promise* in reducing the noise exposure of car shaker operators:

- *Top pad attenuator;*
- *Foot pads; and*
- *Air-actuated cushions.*

6. Channel Burners

MSHA considers the following engineering noise controls, or a combination of these controls, to be **technologically achievable** in reducing the noise exposure of miners operating channel burners:

- **Automated channel burner to replace manual channel burners for the majority of cuts. A handheld channel burner may be needed to initiate the main cut or to perform specialty cuts;**
- **Automated channel burner with a control booth and video monitoring system to observe the cut;**
- **Remote controls; and**
- **Appropriate pressures for the fuel/air mixture as per manufacturer's specifications. Use oxygen instead of air.**

While MSHA considers the following engineering noise controls to be **technologically achievable** in reducing the noise exposure of a miner operating a channel burner, the feasibility of their use must be evaluated on a case-by-case basis:

- **Slot drill in combination with a 3-sided or portable enclosure for the operator;**
- **Wire saw or diamond wire saw;**
- **Use of hydraulic or pneumatic drill; and**
- **Water jet cutter.**

The following control offers *promise* in reducing a miner's noise exposure:

- *Quiet tips on the burner.*

7. **Continuous-Mining Machines / Augers / Loaders (Underground)**

MSHA considers the following engineering and administrative noise controls, or a combination of these controls, to be **technologically and administratively achievable** in reducing the noise exposure of miners operating on or working around this equipment:

- **Remote control with proper positioning of the operator;**
- **Treated cutting heads on auger miners (e.g., the application of stiffening gussets to the helix and filling of voids with sand);**
- **Proper maintenance, such as replacing bent or misaligned conveyor flights or sides and use of a chain with proper tension or one having an automatic chain tension device;**
- **Locate the shuttle car change-out point away from major noise sources (e.g., auxiliary fan);**
- **Avoid idle parking in high noise areas;**
- **Keep miners away from auxiliary fans;**
- **Have mechanics and electricians avoid working near high-noise sources during maintenance;**
- **Reduce utility personnel working time near face and auxiliary fan;**
- **Limit operation of empty chain conveyors on all equipment (i.e., shuttle car, loading machine, continuous miner, miner-bolter, and feeder-breaker);**
- **Eliminate a high-pitched screech by instructing roof bolters to drill straight holes and to avoid metal strap contact with the drill steel;**
- **Follow a cutting cycle (e.g., reduce cutting into roof and floor rock, cutting directly into in-seam rock, and over sumping) to minimize noise generation from both the continuous mining machine and the cutting process;**

- **Regulate engine RPM on diesel-powered shuttle cars during loading and dumping;**
- **Follow shuttle car loading and tramming procedures that minimize noise (e.g., time that the conveyor chain is turning, increase distance from continuous miner and its boom, etc.);**
- **Follow loading and tramming procedures for loading machines that minimize noise;**
- **Turn off any mobile equipment when not in operation;**
- **Maintain proper fan blade clearance on dust scrubbers associated with continuous-mining machines; and**
- **Constrained layer damping on the conveyor pan on an auger miner (e.g., the application of visco-elastic materials covered with wear steel to isolate the chain and flights from the conveyor pan line).**

The following engineering controls offer *promise* in reducing the noise exposure of miners working on continuous miner sections:

- *Transparent barrier between the operator and conveyor pan line;*
- *Constrained layer damping on the conveyor pan on a continuous ripper miner (e.g., the application of visco-elastic materials covered with wear steel to isolate the chain and flights from the conveyor pan line);*
- *Sand-filled conveyor decks;*
- *Enclosure and isolation of motors and pump housings where they have been demonstrated to be a significant noise source;*
- *Vibration isolation mounts on motors/pumps where they have been demonstrated to be a significant noise source;*
- *Chain conveyor with coated flights;*
- *Isolated cutting bits (e.g., the application of vibration isolation materials between the bits/block and the drum); and*
- *Sand-filled cutting heads.*

The following administrative control offers *promise* for reducing an operator's noise exposure:

- *Rotate center bolter operator with center bolter helper, roof bolter operators with utility personnel or shuttle car operators, miner-bolter operator with loading machine operator, or continuous miner operator with shuttle car operator.*

The following noise controls offer *promise* for dust scrubbers associated with continuous-mining machines:

- *Silenced fan housing;*
- *Sleeve-style attenuators;*
- *Alternative face air flow distribution systems (e.g., spray fan systems);*
- *Bolt-on attenuators; and*
- *Appropriately selected, correctly installed, and properly maintained acoustical materials (see Section One Introduction) applied to the dust scrubber.*

8. Diesel - Locomotives

MSHA considers the following engineering noise controls, or a combination of these controls, to be **technologically achievable** in reducing the noise exposure of miners working around this equipment:

- **Environmental cabs that include appropriately selected, correctly installed, and properly maintained acoustical materials (See Section One Introduction) applied to internal surfaces;**
- **Mufflers;**
- **Video cameras with monitors to view the rail and loading process;**
- **Smooth rail joints; and**
- **Good machine and track maintenance.**

MSHA considers the following engineering noise control to be conditional:

- **Appropriately selected, correctly installed, and properly maintained acoustical materials (see Section One Introduction) to the inside of the operator's compartment.**

The following engineering noise controls offer *promise*:

- *Composite wheels to prevent wheel-track squeal;*
- *Transmission enclosure; and*
- *Application of sound damping materials to the floorboards at the transmission.*

9. Diesel - Underground Diesel-Powered Equipment

MSHA considers the following engineering noise controls, or a combination of these controls, to be **technologically achievable** in reducing the noise exposure of miners operating underground diesel-powered equipment (e.g., LHDs, shuttle cars, haul trucks, tractors, generators, graders, scoops):

- **OEM Environmental cabs that include appropriately selected, correctly installed, and properly maintained acoustical materials (see Section One Introduction) applied to internal surfaces; and**
- **Exhaust mufflers.**

MSHA considers the following engineering noise controls to be conditional:

- **Non-OEM cabs; and**
- **Appropriately selected, correctly installed, and properly maintained acoustical materials (see Section One Introduction) to reduce noise from the engine and transmission compartments.**

The following controls offer *promise* in reducing a miner's noise exposure:

- *Redirection of the exhaust away from the operator; and*
- *Remote controls.*

10. Draglines, Shovels, and Cranes Not Equipped with Operator Cabs

MSHA considers the following engineering noise controls, or a combination of these controls, to be **technologically achievable** in reducing the operator's noise exposure:

- **Seal all openings (e.g., holes, cracks, openings around controls) to prevent outside noise from entering the operator compartment; and**
- **Exhaust mufflers.**

MSHA considers the following engineering noise controls to be conditional:

- **A barrier behind the operator to block the noise path of the diesel engine from reaching the operator compartment. The barrier may be flexible, constructed of acoustical vinyl curtain, or rigid;**
- **Appropriately selected, correctly installed, and properly maintained acoustical materials (see Section One Introduction) installed on the surfaces of the operator compartment, to the roof, sliding door, partition (if rigid) and any other available surface; and**
- **Silencers on air discharge valves.**

The following administrative controls offer *promise* for reducing the mechanic/ greaser/oiler noise exposure:

- *Limit time spent in engine compartment when the machine is running; and*
- *Perform cleanup duties when the dragline is not operating.*

11. Draglines, Shovels, and Cranes Equipped with Operator Environmental Cabs

MSHA considers the following engineering noise control to be **technologically achievable** in reducing the operator's noise exposure:

- **Existing OEM environmental cab including appropriately selected, correctly installed, and properly maintained acoustical materials (see Section One Introduction) applied to the interior surfaces.**

  MSHA considers the following engineering noise control to be conditional:
  - **Appropriately selected, correctly installed, and properly maintained acoustical materials (see Section One Introduction) to an existing OEM cab.**

Normally, the existing OEM environmental cab will be sufficient for assuring the operator's compliance.

MSHA considers the following engineering and administrative controls to be **technologically and administratively achievable** in reducing the oiler's noise exposure:

- **Performance of cleanup duties during downtimes for repairs/maintenance;**
- **Limited exposure near the MG set;**
- **Limited oiler time in the revolving frame; and**
- **Rotation of the oiler and machine operator, oiler and dozer operator/groundsmen.**

The following engineering controls offer *promise* for reducing oiler and mechanic noise exposure:

- *Barrier installed in front of MG sets, or where practical, enclosing the MG sets (may require additional ventilation or air conditioning); and*
- *Silencers on cooling fan motors.*

The following engineering and administrative controls offer *promise* for reducing the oiler noise exposure:

- *Silencers on compressed air discharge lines;*
- *Reduction in the time spent in engine house and revolving frame by utilizing the following:*
  - *Automatic lubrication system;*
  - *Remotely monitored temperature sensors;*
  - *Remotely monitored oil level gauges; and*
  - *Remotely monitored video coverage of strategic areas.*

The oiler and mechanic, due to their work demands, must spend time in the environment of the engine house. The isolation of the MG sets by either constructing a partial barrier in front of the sets or by totally enclosing them would reduce the sound levels. The implementation of this promising control would most likely require additional ventilation or air-conditioning for the MG sets.

12. Dredges and Associated Equipment

MSHA considers the following engineering noise controls, or a combination of these controls, to be **technologically achievable** in reducing the noise exposure of the dredge operator:

- **Environmental cab/booth that includes appropriately selected, correctly installed, and properly maintained acoustical materials (see Section One Introduction) applied to internal surfaces;**
- **Pump enclosures;**
- **Engine barriers;**
- **Engine mufflers;**
- **Resilient screen decking;**
- **Barriers around pneumatic equipment;**
- **Redirection of the exhaust; and**
- **Enclosures / barriers at transfer points.**

The following engineering noise control offers *promise*:

- *Video technology to position miners away from noise sources.*

13. Drills - Jumbo Drills

MSHA considers the following engineering noise controls, or a combination of these controls, to be **technologically achievable** in reducing the noise exposure of miners operating jumbo drills:

- **Environmental cabs that include appropriately selected, correctly installed, and properly maintained acoustical materials (see Section One Introduction) applied to internal surfaces;**
- **Barrier such as a windshield; and**
- **Exhaust mufflers.**

MSHA considers the following engineering noise controls to be conditional:

- **Barrier between the engine/compressor and the operator;**
- **Flexible curtain material around the perimeter of the canopy; and**
- **Appropriate acoustical materials (see Section One Introduction) at the operator's position on a cab equipped jumbo drill.**

While MSHA considers the following control to be **technologically achievable** in

reducing the noise exposure of a miner operating a jumbo drill, the feasibility of its use must be evaluated on a case-by-case basis:

- **Hydraulic drill.**

The following controls offer *promise* in reducing miner noise exposures:

- *Remote controls;*
- *Ceramic or other non-metallic centralizers on the drill assembly;*
- *Programmable jumbo drills (computer automated); and*
- *Wet drilling (i.e., injection of water under pressure into the air stream of the drill hole clearance system) where it can be implemented due to the jumbo drill's design and when compatible with the geology and the mining method.*

14. Drills – Truck Mounted / Blast Hole / Air Track

MSHA considers the following engineering noise controls, or a combination of these controls, to be **technologically achievable** in reducing the noise exposure of miners operating drills:

- **Environmental cabs that include appropriate acoustical materials (see Section One Introduction) applied to internal surfaces;**
- **Exhaust mufflers and redirection of the exhaust away from the operator;**
- **Portable enclosures / barriers for the operator; and**
- **Appropriately selected, correctly installed, and properly maintained acoustical materials (see Section One Introduction) to treat the operator's compartment.**

MSHA considers the following engineering noise controls to be conditional:

- **Barrier between the engine /compressor and the operator;**
- **Silencers on air release nozzles; and**
- **Relocation of the air compressor away from the air track drill.**

The following control offers *promise* in reducing miner noise exposures:

- *Wet drilling (i.e., injection of water under pressure into the air stream of the drill hole clearance system) where it can be implemented due to the drill's design and is compatible with the geology and the mining method.*

15. Hand-Held Percussive Tools

MSHA considers the following engineering noise controls, or a combination of these controls, to be **technologically achievable** in reducing the noise exposure of miners operating many types of percussive tools:

- **Exhaust muffler; and**
- **Body muffler.**

MSHA considers the following engineering noise control to be conditional:

- **Piping exhaust away from the operator.**

16. Longwalls

MSHA considers the following engineering noise controls, or a combination of these controls, to be **technologically achievable** in reducing the noise exposure of miners working around the longwall mining system:

- **Automated shear;**
- **Automated jacks;**
- **Automated stage loader;**
- **Memory cut;**
- **Proper maintenance such as use of proper chain tensioning and flight spacing;**
- **Positioning of the miner to minimize exposure to noise such as keeping stageloader operator away from crusher, motors and gears, head drive, belt tail; head drum shear operator staying a minimum or 3 m (10 ft) outby the drum head; and**
- **Reduced run-time for face and stageloader conveyors when empty.**

MSHA considers the following engineering noise controls to be conditional:

- **Remote operation.**

MSHA also considers the following noise controls to offer *promise* in reducing the noise exposure of the shear operators and other miners working around the longwall mining

system:

- *Barriers where appropriate;*
- *Appropriately selected, correctly installed, and properly maintained acoustical materials (see Section One Introduction);*
- *Rotation of head and tail shear operators with each other, shear operators with shieldman, stageloader operator with shieldman;*
- *Video cameras to monitor the cutting and other functions to limit miner exposure;*
- *Enclosure of motors, gears, pumps where demonstrated to be a significant noise source and can be done without damage to the equipment;*
- *Damping of enclosures and panels where demonstrated to be a significant noise source;*
- *Water-cooled motors instead of air-cooled motors where practical and when the motors are a significant source of noise exposure;*
- *Enclosure for the other miners (e.g., headgate operators) where practical;*
- *Isolated cutting bits on the longwall drum (e.g., the application of vibration isolation materials between the bits/block and the drum); and*
- *Sand-filled cutting heads.*

17. Mantrips

Mantrips and other similar modes of transportation may be a significant contributor to a miner's overall noise exposure and should be examined on a case-by-case basis. When attempting to reduce a miner's noise exposure, there are instances where engineering controls should be applied to mantrips to achieve a significant reduction.

MSHA considers the following engineering noise controls, or a combination of these controls, to be **technologically achievable** in reducing the noise exposure of miners working around and riding in mantrips:

- **Muffler(s);**
- **A fully enclosed passenger compartment**
- **Smooth rail joints; and**
- **Good machine and track maintenance.**

MSHA considers the following engineering noise controls to be conditional:

- **Motor enclosure for those machines where the motor is a significant noise source; and**
- **A passenger compartment treated with appropriate acoustical materials (see Section One Introduction).**

The following control offers *promise* in reducing miner noise exposures:

- *Composite wheels to reduce wheel-rail squeal.*

18. Mills / Processing Plants / Coal Preparation Plants (including Breakers at Anthracite Mines)

Miners working in mills, processing plants, coal preparation plants and breakers at anthracite mines, typically encounter high sound levels and are engaged in mobile occupations. Consequently, it is usually necessary to identify where and which tasks contribute the most to the miner's overall noise exposure, i.e., time-motion study. The successful reduction of a miner's noise exposure depends on the application of engineering and administrative controls to the locations and tasks which contribute the most to the miner's overall noise exposure. Therefore, the application of these controls must be evaluated on a case-by-case basis.

MSHA considers the following engineering and administrative noise controls, or a combination of these controls, to be **technologically and administratively achievable** in reducing the noise exposure of miners working in coal preparation plants and metal/nonmetal processing plants and mills:

- **Acoustically treated control booths; and**
- **Full enclosures without a top around equipment or miner work locations;**
- **Electro-mechanical sensing devices to limit exposure times;**
- **Video technology to limit exposure time;**
- **Bin-level indicators;**
- **Rotation of plant operator with control room operator; inside mechanics with outside mechanics; high-noise floor workers with low-noise floor workers; and in-plant workers with outside-plant workers;**
- **Limit plant worker time on noisy floors, working in or next to noisy equipment such as screens, crushers, centrifuges, and dryers;**
- **Relocate work stations / controls to quieter locations;**
- **Relocate tool boxes, cabinets, and supplies to quiet area;**
- **Operate noisy equipment / processes (welding, grinding, etc.) when fewer miners will be exposed; and**
- **Perform maintenance during downtimes, if possible.**

MSHA considers the following engineering noise controls to be conditional:

- **Partial enclosures without a top around equipment or miner work locations;**
- **Barriers, including curtains, especially on traveled walkways;**
- **Acoustic baffles suspended above enclosures;**
- **Resiliently backed mill liners;**
- **Chute liners;**
- **Covered chute enclosures;**
- **Dead boxes and impact pads; and**
- **Resilient screen decking.**

Other noise controls that offer *promise* for reducing the noise emitted from screens and other sizing devices include:

- *Replacement of spring mounts with vibration isolation mounts made of rubber, ROSTA mounts, and air bags (due to the engineering parameters involved in this type of equipment and the forces generated being transferred to the structure, their use should be considered on a case-by-case basis in conjunction with the equipment manufacturer);*
- *"Double isolation" mounting methods; and*
- *Banana screens (due to height requirements, banana screens may be applicable only in certain situations.)*

The following administrative control offers *promise* for reducing an operator's noise exposure in coal preparation plants:

- *Move density measuring to quiet location.*

19. Mobile Equipment -- Surface

MSHA considers the following engineering noise controls, or a combination of these controls, to be **technologically achievable** in reducing the noise exposure of miners operating surface mobile equipment (e.g., bulldozers, front-end loaders, trucks, graders, scrapers):

- **Environmental cabs (primarily on equipment manufactured since the mid-1970s) that include appropriately selected, correctly installed, and properly maintained acoustical materials (see Section One Introduction);**
- **Exhaust mufflers; and**
- **Redirection of the exhaust away from the operator.**

MSHA considers the following engineering noise controls to be conditional:

- **Installation of a full or partial skin kit to the ROPS/FOPS.**
- **Appropriate acoustical materials (see Section One Introduction) to treat the operator's compartment.**

The following control offers *promise* in reducing miner noise exposures:

- *Remote controls.*

20. Portable Crushers / Screening Plants and Associated Equipment

MSHA considers the following engineering noise controls, or a combination of these controls, to be **technologically achievable** in reducing the noise exposure of crusher operators:

- **Acoustically treated environmental control booths isolated from the main structure through the use of vibration-isolation techniques or through physical isolation (permanent or portable);**
- **Remotely controlled picks;**
- **Video monitoring of plant operations;**
- **Mufflers; and**
- **OEM controls on diesel engine/generator sets.**

MSHA considers the following engineering noise controls to be conditional:

- **Sound damping material at transfer points;**
- **Chute liners;**
- **Resilient screen decking; and**
- **Barriers, especially on traveled walkways.**

21. Roof Bolting Machines

MSHA considers the following engineering control and work practices to be **technologically and administratively achievable** in reducing a miner's noise exposure when working on or around a roof bolting machine:

- **Wet drilling (where it can be implemented due to the roof bolter design and when compatible with the geology and mining method);**
- **Sharp drill bits;**
- **Starter drill steel to begin the hole;**
- **Straight drill steel (one piece and with thick wall, if conditions and dust collection allow);**
- **Replacement of worn or defective drilling components (e.g., drill pot bushings or bearings, worn steel, bent steel); and**
- **Maintenance of manufacturer-recommended drilling parameters for thrust, torque, and rotational speed.**

The following engineering controls and work practices offer *promise* in reducing a miner's noise exposure:

- *Automated dust collection system or actuation of the dust collection system motors only during drilling, or use of administrative controls to accomplish the same task;*

- *Exhaust conditioner (water box) and/or manufacturer-recommended exhaust muffler;*
- *Controls for optimizing the drilling parameters (drill feedback system);*
- *Water misting system (i.e., injection of a small volume of water in a mist form into the drill hole clearance system);*
- *Grommet to isolate the drill steel and chuck;*
- *Acoustical liner in the tool tray; and*
- *Damped drill steels.*

22. Scalers

MSHA considers the following engineering noise controls, or a combination of these controls, to be **technologically achievable** in reducing the noise exposure of miners working around scalers:

- **Environmental cabs that include appropriately selected, correctly installed, and properly maintained acoustical materials (see Section One Introduction) applied to internal surfaces;**
- **Sealing of openings (e.g., around the gear controls, doors); and**
- **Muffler.**

MSHA considers the following engineering noise controls to be conditional:

- **Appropriately selected, correctly installed, and properly maintained acoustical materials (see Section One Introduction) on the inside surfaces of existing cabs; and**
- **Barrier between the engine and the operator.**

23. Stone Saws

MSHA considers the following engineering noise controls, or a combination of these controls, to be **technologically achievable** in reducing the noise exposure of the stone saw operator:

- **Operator booth with appropriately selected, correctly installed, and properly maintained acoustical materials (see Section One Introduction) applied to internal surfaces; and**
- **Barrier between the saw and the operator.**

There are two types of cutting blades. One is a silent core blade that is laminated. The other is a composite blade with filled expansion slots. These are available for all existing saws. Blade maintenance and the type of saw blade also are important factors.

Methods that offer *promise* in reducing the noise exposure of miners using stone saws include:

- *Quiet or composite blades; and*
- *Wet sawing systems.*

Section Two
Practical Approach to Reducing A Miner's Noise Exposure

MSHA believes that there is a practical approach that can be taken to reduce a miner's exposure to noise. Consideration of the responses to the following questions can be a valuable part of the noise control evaluation process. Besides the reduction of noise exposure, proper maintenance, work practices, and procedures, if applicable, may result in increased efficiency and less downtime.

Maintenance

- Are all existing noise controls maintained?
- Are mechanical components / systems adequately maintained including maintaining and greasing rollers, bearings, hubs, etc.?
- Are bolts tight, covers and compartments secure to prevent noise exposures?
- Do smooth transitions exist between track rails?
- Are openings around doors and between compartments sealed? Are air conditioners installed? Are broken windows repaired?
- Is all equipment properly maintained to reduce excessive noise resulting from lack of oil, grease, worn parts, etc.?
- Are miners instructed on proper use, operation and maintenance of equipment with noise controls?
- Is the air conditioning in booths and enclosures maintained?
- Are filters replaced on a scheduled basis for all air conditioners?

Work Practices

- Are sharp cutting tools used?
- Do dust collection systems operate only when needed?
- Are proper thrust, rotational speed, torque and chain tensioning being used?
- Are good work practices being employed?
- Are there work practices that result in unnecessary exposure to noise?
- Are conveyors operated either wet or with materials?

- Are doors and windows to cabs and booths kept closed?
- Are radios turned off or the volume reduced as low as possible?
- Is the exposed miner maintaining the greatest distance from the noise source while still being able to perform his/her job?
- What kind of cleanup or maintenance is used, e.g., hand shovels vs. small loaders?
- Do miners spend their breaks near high noise areas?
- Do miners park or idle equipment in high noise areas for waiting, loading or dispatching?
- Do miners stand next to high noise areas?
- Are manufacturer's air pressure recommendations followed for air-operated equipment?
- Are manufacturer's recommendations / maintenance schedules, etc. followed?
- Are air hoses used for cleanup rather than manual tools, vacuuming, or washing down with water?
- Is equipment located in such a manner to minimize miner exposures?

Engineering / Administrative Controls

- Are all feasible engineering and administrative controls installed and maintained?
- Are environmental cabs used on surface mobile equipment?
- Can a video camera/monitor be used to observe critical operations, thus limiting a miner's exposure?
- Can a remote control system be used to remove an operator or miner from a noisy environment?
- Are sound-treated booths provided for miner use, even on a periodic basis, where applicable?
- Are exhausts directed away from miners?
- Can miners be rotated to reduce exposure?
- Has the proper type of acoustical material been selected to suit the job? Has consideration been given to the material's flammability properties?
- Do impact points employ vibration damping materials?
- Do barriers separate miners and noise sources?

- If multiple noise sources are present, can barriers be installed to prevent the combined effects of sources?
- Is cleanup performed when the plant is running?
- Are normal travelways located away from noise sources?
- Are high noise areas identified with warning signs?
- Are miners instructed to avoid these high noise areas?
- Can noisy machines be replaced by quieter ones?
- When new or used equipment is purchased, are noise controls included? Is sound level or exposure data included?
- Is a "Buy Quiet" program in effect at the mine for the purchase of the quietest new and used equipment available?
- Has noise been considered in operational design?

Section Three
Some Examples of Administrative Controls

MSHA considers the following administrative controls to be applicable in many mining situations but administrative achievability must be assessed on a case-by-case basis. The following controls should be discussed with miners, miners' representatives and mine operators during the inspection process, as appropriate.

1. Adjust work schedules.
   - Share work tasks and/or rotate miners.
   - Schedule work tasks during quiet periods.
   - Limit duration of work shifts.

2. Utilize work practices to lower noise exposures.
   - Position miners in quieter locations without increasing safety risks;
   - Keep miners from congregating at high-noise areas;
   - Provide quiet areas while taking breaks;
   - Limit the duration of noisy tasks;
   - Switch / rotate miners from high- to low-noise exposure jobs/occupations;
   - Modify work activities to shorten time or decrease noise level;
   - Provide job-task-analysis training for the specific occupation to complete tasks more efficiently, safely, and in a manner to reduce the occupational noise exposure;
   - Eliminate tasks that are unnecessarily noisy;
   - Operate noisy equipment or complete noisy tasks during periods when fewer miners will be exposed; and
   - Restrict or limit miner access to high noise areas.

3. Use real-time noise dosimetry / instrumentation to measure exposures, trigger an administrative control, and prevent overexposures.

4. Use remote sensing technology and video monitoring.

5. Designate low-noise walkways /areas (e.g., dinner holes) or locate walkways /areas away from noise sources.

6. Assure maintenance practices critical to reducing noise generation are identified and followed:
   - Keep chain tension adjusted to specifications;
   - Keep panels tightly bolted;
   - Keep seals around compartments secure; and
   - Keep drive trains aligned and lubricated.

Background

Overexposure to occupational noise continues to be a pervasive health problem. As such, MSHA would like to offer its assistance to mine operators in the implementation of the noise standard.

Authority
30 CFR Part 62

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Appendix 6

U.S. Department of Labor

Mine Safety and Health Administration
1100 Wilson Boulevard
Arlington, Virginia 22209-3939

ISSUE DATE: JANUARY 27, 2004

PROGRAM INFORMATION BULLETIN NO. P04-05

FROM: RAY McKINNEY
Administrator for
Coal Mine Safety and Health

ROBERT M. FRIEND
Administrator for
Metal and Nonmetal Mine Safety and Health

SUBJECT: Basis for Assigning a P-Code for Noise Overexposure

Scope

This Program Information Bulletin (PIB) affects surface and underground coal and metal/nonmetal mines.

Purpose

Recently the Mine Safety and Health Administration (MSHA) has become aware that there are some misconceptions concerning the noise rule. This PIB clarifies several misunderstandings concerning P-codes. In the paragraphs below, you will find an explanation of what a P-code is, and the circumstances under which P-codes are assigned.

Information

MSHA has acknowledged that there are instances where all feasible engineering and administrative controls are being used and a miner's noise exposure cannot be reduced to the permissible exposure level. MSHA uses the letter "P" as an action code in its database to designate that an overexposure condition remains even though all feasible engineering and administrative controls are in place. Thus, a "P-code" is an administrative device that allows MSHA to track these situations. The term P-code derives from the requirement to wear protective equipment, i.e. the mine operator must provide the appropriate hearing protection to the affected miner and the miner must wear the hearing protection.

A P-code is not a petition for modification, because § 101(c) of the Mine Act only allows a petition for modification for mandatory safety standards. A P-code simply provides

MSHA with a means of tracking special overexposure situations. A P-code does not establish an alternative method of compliance with the noise standard. Therefore, mine operators may not apply for P-codes. In addition, P-codes are not assigned to pieces of equipment or to areas of a mine. MSHA will determine the suitability of a P-code on a case-by-case basis. The agency will identify the principal noise source(s) that contributed to the miner's overexposure and will include them in the documentation of the conditions that constitute grounds for a P-code. If the District Manager (DM) believes a P-code is warranted, the DM reviews the situation in consultation with field enforcement staff, headquarters' officials, and MSHA technical experts.

There are two scenarios involving a miner's overexposure to noise where the use of a P-code would be appropriate. In the first scenario, an MSHA inspector would determine that a miner's full-shift exposure exceeds the PEL. If MSHA also determines that: (1) all feasible engineering and administrative controls have already been implemented and are maintained; (2) all affected miners are enrolled in a Hearing Conservation Program that complies with each element of 30 CFR § 62.150; (3) hearing protection has been provided by the mine operator and is being worn by the affected miners; and, (4) the mine operator has posted (on the mine bulletin board) and provided affected miners with copies of any procedures for administrative controls being used, then a P-code will be assigned for the circumstances leading to the affected miner's overexposure. These circumstances include the job or occupation the miner is performing, the area where the miner works, and the equipment the miner is using or that is a source of the overexposure. A P-code will be assigned only if the mine operator has fully complied with each of the above requirements. Under this scenario, an operator would not receive a citation prior to the P-code being assigned.

In the second scenario, an MSHA inspector would determine that a miner's full-shift exposure exceeds the PEL. However, unlike the first scenario, MSHA would also have determined that the mine operator has failed to fully comply with some aspect of 30 CFR § 62.130. A citation would be issued because the mine operator has failed to: (1) implement or maintain all feasible engineering and administrative controls; or (2) enroll all affected miners in a Hearing Conservation Program that complies with each element of 30 CFR § 62.150; or (3) ensure that hearing protection has been provided to the affected miners and is being worn by the affected miners; or (4) post (on the mine bulletin board) and provide affected miners with copies of any procedures for administrative controls. In this scenario, a citation would be issued and an abatement period would be set. If compliance with the PEL still cannot be achieved through the implementation of (1) through (4) above, a P-code will be assigned and the citation will be terminated.

Once a P-code has been assigned, a mine operator must continue to abide by all of the noise requirements of Part 62. MSHA will review and re-evaluate all P-codes periodically to determine whether conditions have changed. A P-code can be

withdrawn if the original justification for the P-code is no longer valid, i.e. if: (1) a mine operator fails to comply with the minimum specified engineering and administrative controls; or (2) a full-shift dosimeter sample demonstrates that the operator has reduced the affected miner's exposure to the PEL; or (3) new feasible technology becomes available and the mine operator refuses to implement the technology; or (4) the mine operator fails to comply with any of the requirements of 30 CFR § 62.130.

Background

Overexposure to occupational noise continues to be a pervasive health problem. As such, MSHA would like to offer its assistance to mine operators in the implementation of the noise standard.

Authority

30 CFR Part 62

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Appendix 7

In order to have a sufficient number of instruments available to continue conducting health surveys , and to ensure that the calibration lab is not overloaded , submit only ¼ of the total number of calibrators and dosimeters on hand during each of the four months specified.

DISTRICT	***Months***	***To***	***Send***	***Instruments***
Northeast	January	April	July	October
Southeast	January	April	July	October
North Central	February	May	August	November
South Central	February	May	August	November
Rocky Mountain	March	June	September	December
Western	March	June	September	December