

U. S. Mining Enforcement and Safety Administration

U. S. Mine Safety and Health Administration

MESA/MSHA Informational Reports

1974 – 2011

(Includes Subject Index)

January 6, 2011

MESA/MSHA Informational Reports

Informational Reports (IRs) are an on-going series of scientific and technical publications produced by the Mine Safety and Health Administration.

Active List of Permissible Explosives and Blasting Devices Approved Before December 31, 1975 by J. Ribovich; R. W. Watson and J. J. Seman (C/MNM)

Lists permissible explosives approved before December 31, 1975.

MESA 1976 10 pp

Report No: IR 1046

Analysis of Accidents Related to Falls of Ground in Metal and Nonmetal Mines, 1972-1973 by E. D. Seals and R. A. Speirer (MNM)

This is a statistical survey of accidents resulting from fall of ground in metal-nonmetal mines from 1972 to 1973.

MESA 1975 7pp

Report No: IR 1009

Analysis of Disabling Injuries Related to Roof Bolting in Underground Bituminous Coal Mines, 1973 by W. K. Miller and R. R. McLellan (C)

Examines coal mine fatalities caused by roof bolting and concludes that the high injury rate for roof bolter operators appears to be closely related to a lack of proper and adequate training. Also, there is an obvious need to develop modifications or to redesign the current roof bolting machines.

MESA 1975 6 pp

Report No: IR 1017

Analysis of Fatal Accidents Involving Front-End Loaders at Metal and Nonmetal Mines, 1972-74 by R. H. Oitto and R. R. McLellan (MNM)

Analyzes front-end loader accidents and concludes that operator error and lack of training are the primary factors in causing loader accidents. The analysis indicates that installing roll-over protection on the machines and providing adequate training for loader operators will contribute substantially toward a reduction of the accident rate.

MESA 1975 7 pp

Report No: IR 1019

Analysis of Fatalities Related to Scoops and Tractors in Underground Bituminous Coal Mines, 1971-73 by R. R. McLellan and R. A. Speirer (C)

Examines coal mine fatalities caused by scoops and tractors and concludes that mines utilizing scoops and tractors should be the target of efforts to emphasize recognition of the particular operating hazards of this equipment and appropriate training of the equipment operators. The best way to reduce fatal accidents of this kind is to design workable and acceptable canopies which would greatly reduce the number of injuries to the head, neck, and chest.

MESA 1975 7 pp

Report No: IR 1016

Analysis of Haulage Truck Visibility Hazards at Metal and Nonmetal Surface Mines, 1975
by Wayne K. Miller (MNM)

Truck haulage accidents were the greatest single-agent cause of fatal accidents at surface metal-nonmetal mines from 1972 to 1974. Analyses showed that haulage trucks had operator visibility problems which led to accidents. This report examines these visibility problems

MESA 1976 19 pp

Report No: IR 1038

Analysis of Injuries Associated with Maintenance and Repair in Metal and Nonmetal Mines by Michael P. Tierney (MNM)

Discusses injuries resulting from different maintenance and repair activities in metal-nonmetal mines.

MESA 1977 34 pp

Report No: IR 1058

Analysis of Injuries Involving Jackleg Rock Drills Underground, 1973 – 74 by R. H. Oitto (MNM)

Examines injuries involving jackleg rock drills that occurred underground in 1973 and 1974. Safety guidelines for operating jackleg rock drills are presented.

MESA 1975 16 pp

Report No: IR 1024

Analysis of Noise Reduction with Earmuff Hearing Protectors under Field Conditions by Jon Kogut and Richard J. Goff (C/MNM)

Reviews 540 field tests comparing a-weighted noise levels measured inside and outside a variety of earmuff hearing protectors. The report concludes that the earmuffs effectiveness in reducing noise frequently falls far short of the manufacturer's NRR (noise reduction rating).

MSHA 1994 42 pp

Report No: IR 1221

Analysis of Truck Related Fatalities and Disabling Injuries at Metal and Nonmetal Surface Mines by Wayne K. Miller (MNM)

Analyzes truck related fatalities and injuries at surface metal-nonmetal mines. The report concludes that the most frequent causes of disabling injuries were: (1) victim slipping and falling while dismounting or mounting the haulage truck, (2) steering wheels being twisted out of the operator's hands, and (3) brake failure. These causes accounted for 68 percent of the truck haulage disabling injuries.

MESA 1975 8 pp

Report No: IR 1022

Application of Statistics to Radiation Survey in Mines by F. Leo Misaqi (MNM)

The primary purpose of this publication is to familiarize mine inspectors and safety engineers with the seemingly complex subject of radiation data evaluation in terms of both practical and statistical accuracy through an extensive use of examples and sample problems. It explains the random nature of measurements, illustrates statistical treatment of data, and shows the need for planning of sampling procedures on the basis of statistical criteria.

MESA 1975 26 pp

Report No: IR 1020

Asbestiform and/or Fibrous Minerals in Mines, Mills and Quarries by Walter Bank (C/MNM)

Asbestiform minerals, fibrous minerals or elongated cleavage fragments play significant roles in mineral fiber-induced lung damage in miners. The document has two appendices. One appendix describes asbestiform and fibrous minerals. The other appendix lists mines where these minerals are present.

MSHA 1980 25 pp

Report No: IR 1111

Blowing Versus Exhausting Face Ventilation for Respirable Dust Control on Continuous Mining Sections by R. Lindsay Mundell (C)

Discusses advantages and disadvantages of blowing and exhausting face ventilation systems. Results of respirable dust surveys conducted on sections employing blowing and exhausting face ventilation indicate that significantly lower respirable dust concentrations in the face area result when employing exhausting face ventilation.

MESA 1977 11 pp

Report No: IR 1059

Calibration and Maintenance Procedures for Coal Mine Respirable Dust Samplers by

Thomas F. Tomb and Paul S. Parobeck (C)

Presents the standard procedures used by MSHA for calibration of currently approved personal samplers and associated equipment and maintenance procedures for the equipment. Supersedes IR 1073.

MSHA 1992 22 pp

Report No: IR 1121 (Rev)

Calibration and Maintenance Procedures for Coal Mine Respirable Dust Samplers by

Thomas F. Tomb and Paul S. Parobeck (C)

Describes the standard procedures used by MSHA for calibration of currently approved personal samplers and associated equipment and for maintenance of this equipment. Supersedes IR 1121.

MSHA 1996 19 pp

Report No: IR 1240

Calibration Procedures for Radon and Radon-Daughter Measurement Equipment by

Robert T. Beckman (MNM)

Describes the apparatus and procedures necessary to calibrate the various types of equipment used for radon and radon-daughter measurement. Describes air sampling devices, counting instruments, and other specialized equipment for measuring radon gas and both attached and unattached radon daughters.

MESA 1975 47 pp

Report No: IR 1005

Cleaning Out, Sealing and Mining Through Wells Penetrating Areas of Active Coal Mines in Northern West Virginia by Paul J. Componation; Jack E. Tisdale and Joseph Pasini III (C)

Covers demonstrations that began in 1971 to prove the effectiveness of well plugging as a substitute for the support pillars normally left around oil and gas wells. The purpose of the demonstrations was to achieve safer mining by elimination of problems-mainly adverse roof stress distribution and disruption of normal haulage and ventilation systems-caused by the presence of the support pillars. The recovery of the coal in the well-support pillars was a secondary purpose.

MESA 1977 20 pp

Report No: IR 1052

Coal Mine Dust Sample Processing by Lewis D. Raymond (C)

Describes further changes in the equipment and procedures used by MSHA to maintain a state-of-the-art facility or processing respirable coal mine dust samples in accordance with regulatory requirements. Supersedes IR 1045 and IR 1156.

MSHA 1998 26 pp

Report No: IR 1249

Coal Mine Injury and Employment Experience by Occupation, 1972 - 1975 by John Kogut and Rhys G. Llewellyn (C)

Presents injury and employment experience, from 1972 through 1975, of selected occupations within the coal mining industry. Rates are used to establish a ranking of occupations according to how hazardous they are.

MESA 1978 30 pp

Report No: IR 1065

Coal Mine Injury and Employment Experience by Occupation, 1976 – 1980 by Leonard P. Larson (C)

Presents the injury and employment experience, from 1976 through 1980, of selected occupations in the coal mining industry. Injury data from the MSHA Health and Safety Analysis Center's database are matched with employment data for individual occupations collected through respirable dust sampling procedures, providing fatality and injury rate for each occupation.

MSHA 1985 59 pp

Report No: IR 1175

Coal Mine Ventilation Survey Method, (A) by Joseph D. Hadden, Jr. and Robert L. Smith (C)

Presents a practical working tool for conducting mine ventilation surveys under conditions found in most coal mines. The procedures outlined include conducting air pressure and air quantity surveys underground, and fan pressure readings on the surface.

MSHA 1987 68 pp

Report No: IR 1162

Comparative Evaluation of Conventional and Resin Bolting Systems by George J. Karabin, Jr., and William J. Debevec (C)

Examines the use of resin grouted bolts in areas of severe roof conditions. The report suggests that resin grouted bolts have caused improvements in safety and production

MESA 1976 22 pp

Report No: IR 1033

Comparison of Dust Data From 29 Select Underground Coal Mines 1968 – 1986 by Lewis D. Raymond and Thomas F. Tomb (C)

Presents a compilation and analysis of mine operator dust data for selected mines which were surveyed prior to enactment of the 1969 Act and are still in a production status.

MSHA 1989 23 pp

Report No: IR 1194

Comparison of Hearing Protector Rating Methods and Recommendations for use in the Mining Industry by Leonard C. Maraccini (C/MNM)

Discusses four different rating methods in regard to their use in mining environments.

MSHA 1987 28 pp

Report No: IR 1176

Comparison of Infrared Absorbances for Standard Samples Prepared From Sieved and Nonsieved Quartz Reference Materials by Sharon M. Ainsworth; Thomas F. Tomb and Paul S. Parobeck (MNM)

MSHA analyzes respirable coal mine dust samples for quartz content as part of their program to enforce environmental dust levels as mandated by the 1977 Act. A quartz reference material is necessary to prepare calibration curves for the quantitative measurement of the mineral. This report summarizes results of a study conducted to determine if the calibration of x-ray diffraction instrumentation was significantly different after particles larger than 10 micrometers in size were removed from the reference material.

MSHA 1994 14 pp

Report IR 1223

Comparison of Noise Exposure Measurements Conducted with Sound Level Meters and Noise Dosimeters under Field Conditions by Michael P. Valoski; John P. Seiler; Michael A. Crivaro and George Durkt (C/MNM)

Makes absolute and relative comparisons between the measuring positions where noise dosimeters and sound level meters are used in assessing noise exposures.

MSHA 1995 32 pp

Report No: IR 1230

Comparison of Respirable Dust Concentrations Measured With Personal Gravimetric Sampling Instruments Operated On-Section and Portal-to-Portal by Thomas F. Tomb, R. Lindsay Mundell, and Robert A. Jankowski (C)

Describes a study conducted to determine if area samples collected only during on-section time could be used to assess average full-shift respirable dust concentrations in outby areas of a mine where miners work and travel.

MESA 1978 7 pp

Report No: IR 1064

Comparison of Surface Coal Mine Respirable Dust Concentrations Measured with MRE and Personal Gravimetric Sampling Equipment by J. J. Alvarez, T. F. Tomb; R. R. Gadomski, and J. L. Custer (C)

Describes the results of MSHA's sampling of surface mining operations to determine if 1.38 is a valid factor for converting surface coal mine dust samples collected with approved personal samplers to equivalent MRE concentrations.

MSHA 1980 10 pp

Report No: IR 1120

Compilation of Judicial Decisions Which Have an Impact on Coal Mine Inspections by Max J. Cleveland and Everett Turner (C)

A compilation of extracts from pertinent decisions of the Office of Hearings and Appeals, U.S. Department of the Interior, and the Federal Courts on matters pertaining to the enforcement of the Federal Mine Health and Safety Act of 1969. Decisions through October 15, 1976, are included.

MESA 1977 157 pp

Report No: IR 1060

Computerized Slope Stability Analysis of Refuse Piles and Impoundments by the Simplified Bishop Method by Stephen Gerard Sawyer; Daniel S. Mazzei, and Kelvin K. Wu (C)

Presents the steps involved in computer modeling and analyzing refuse piles and impoundments via the Simplified Bishop Method of Slices, a commonly employed technique for circular arc failures. Two example problems which use the well-known computer program entitled SBM (Simplified Bishop Method), which was originally developed at Massachusetts Institute of Technology, are given. For completeness, a listing and description of, and input cards for, the SBM program are presented in the appendices.

MESA 1978 87 pp

Report No: IR 1068

Considerations for Underground Coal Mines that Operate Near Coalbed Methane Wells by Erik, Sherer, David Allen, Tim Bower, David Morris and Dennis Swentosky (C)

The extraction of methane from coal seams and surrounding strata is a rapidly growing component of the domestic natural gas supply. Several types of wells and production methods have been developed to exploit coalbed methane (CBM) resources. This informational report presents an overview of CBM production methods, examines potential hazards to underground coal miners who intersect wells, lists methods to mitigate these potential hazards and identifies considerations for inclusion in approved ventilation plans to address mine-specific CBM-related hazards.

MSHA 2009 32 pp

Report No.: IR 1346

Constrained Layer Composite Saw Blades – An Effective Noise Control Technology by Leonard Marraccini' and John Horner

The purpose of this study was to evaluate and document the sound generating characteristics of a standard steel saw blade and a composite saw blade in both laboratory and actual field conditions.

MSHA 2007 31 pp

Report No: IR 1291

Criteria for Slab Removal at Louisiana Salt Mines by W. W. Lutzens and L. B. Childress (MNM)

Salt mines located in the Gulf Coast area experience the problem of potentially hazardous slabs of salt forming as pillars. A determination must be made as to the relative hazard of slabs and when they should be removed. Criteria have been developed from field observations in two Louisiana salt mines to assist mine management in determining the relative safety of a slab.

MESA 1976 8 pp

Report No: IR 1047

Design and Construction of a Strain-Gaged Resin Bolt for the Measurement of In-Situ Axial Loads, (The) by Stephen Gerard Sawyer and Gordon L. Eakin (C/MNM)

Discusses design and development of the strain-gaged bolts. The step-by-step procedure by which such a bolt can be constructed is given.

MESA 1976 17 pp

Report No: IR 1039

Design Guidelines for Coal Refuse Piles and Water, Sediment, or Slurry Impoundments and Impounding Structures by John W. Thatcher (C)

Presents the guidelines used by the Mine Waste Branches of MSHA's Denver Technical Support and Pittsburgh Technical Support Centers and by MSHA District Managers in their review of engineering plans for coal refuse impoundments. These guidelines give detailed information on the hydrologic, hydraulic, and geotechnical factors that should be considered in planning such structures.

MSHA 1979 29 pp

Report No: IR 1109

Determination of Free Silica in Airborne Dust Collected on Membrane Filters, (The) by John W. Thatcher (MNM)

Describes an X-Ray diffraction method for determining the amount of free silica in airborne dust collected on a polyvinyl chloride (PVC) filter and transferred to a silver filter using a dissolution technique.

MESA 1975 16 pp

Report No: IR 1021

Determining the Feasibility of Area Sampling to Enforce the Respirable Dust Standard in Underground Coal Mines by Thomas F. Tomb and Robert S. Ondrey (C)

Describes a field study conducted in an underground coal mine to evaluate the feasibility of employing the "area sampling concept" for coal dust. It was concluded from this study that the "area sampling concept" could more viably ensure that the intent of the 1969 Act is fulfilled.

MESA 1976 10 pp

Report No: IR 1037

Determining the Quartz Content of Respirable Dust by FTIR by Sharon M. Ainsworth; Paul S. Parobeck; and Thomas F. Tomb (C)

Describes a program for establishing the respirable dust standard in a coal mine when the free silica content of the respirable dust in the mine atmosphere is in excess of five percent.

MSHA 1989 11 pp

Report No: IR 1169

Double Insulated Drill Tests by William J. Helfrich and Richard L. Reynolds (C)

Examines the double insulation system as an alternative to frame grounding and the hazards which could possibly occur when using the drill in coal mines.

MSHA 1978 28 pp

Report No: IR 1081

Dust Sampling and Laboratory Testing Procedures after Underground Coal Mine Explosions (C)

Summarizes the methods for collecting samples for the coal and remaining dust taken after an underground coal mine explosion and discusses the information obtained by analysis of each sample.

MSHA 1996 14 pp

Report No: IR 1239

Effect of Threshold on Noise Dosimeter Measurements and Interpretation of Their Results, (The) by John P. Seiler and Dennis A. Giardino

Discusses the various functions of the noise dosimeter and why data collected with instruments that function at one set threshold level may differ from that collected with an instrument that uses a different, or no, threshold level. Recommendations are made to provide assistance in selecting the threshold level of the dosimeter in order to achieve the desired objective of the noise dose measurement.

MSHA 1994 16 pp

Report No: IR 1224

Electrical Hazards in Underground Bituminous Coal Mines by W. A. Mason (C)

An investigation of 1,404 injuries related to electricity in underground bituminous coal mines. Data analysis indicates that a reduction in electrical accidents is immediately possible by reducing defective splices and insulation breaks and by proper placement of trolley poles. Sixty-six percent of the mine fires investigated by the Bureau of Mines through 1972 and 21 percent of all methane ignitions can be attributed to electrical ignition sources and inadequate design of electrical equipment used in the mining environment.

MESA 1975 5 pp

Report No: IR 1018

Estimating the Rate of Coal Combustion in a Mine Fire by Dennis A. Giardino (C)

A method is presented for estimating the mass of coal per unit time (lbs. /min.) being consumed in a mine fire. The estimate is calculated using an algorithm termed the coal combustion rate (CCR). The theory supporting the CR is given along with its derivation from basic combustion principles. Examples of its use also given employing data from an actual mine fires.

MSHA 1999 30 pp

Report No: IR 1249A

Evaluation of Four Fast-Response Flow Measurement Devices by Andrew J. Gero; Karen L. Suppers and Thomas F. Tomb (C)

Describes an evaluation of dust in coal mine environments conducted on four new flow calibrating devices: the Mast Model 823-2 bubble flowmeter, the Buck Calibrator, the Kurz Model 541S mass flowmeter and the Kurz Pocket Calibrator.

MSHA 1988 8 pp

Report No: IR 1163

Evaluation of Gases from Mine Explosions by Elemental Balancing by Hofer, L. J. E.; D. A. Giardino and Linda F. Zeller

Introduces a new index, called the (H/C) Index, used in investigations of fire and explosions to determine fuel compositions.

MSHA 1996 31 pp

Report No. IR 1231

Evaluation of Muff Type Hearing Protectors as Used in the Mining Industry by Dennis A. Giardino and George Durkt, Jr. (C/MNM)

Summarizes results of a study conducted to evaluate muff type hearing protector devices (HPDs) worn by miners working in a mining environment. The study concludes that field performance of muff type HPDs is significantly less than that predicted by the Environmental Protection Agency Noise Reduction Rating.

MSHA 1994 25 pp

Report No: IR 1222

Evaluation of Radioactive Aerosols in United States Underground Coal Mines by R. L. Rock, G; Svilar; R. T. Beckman, and D. D. Rapp (C)

Radon and its alpha radiation emitting daughter products are known to present a health hazard in a wide variety of non-uranium underground mines. This paper describes the general health problems investigated, evaluation methods employed, and it summarizes the data obtained.

MESA 1975 10 pp

Report No: IR 1025

Evaluation of Two Light-Scattering Respirable Dust Monitors by E. M. Thompson; H. N. Treaftis; T. F. Tomb and A. J. Beckert II (C)

Evaluates two respirable dust sampling instruments employing the principle of light scattering to measure the mass concentration of an aerosol. One instrument was developed under Bureau of Mines Research Establishment of the Steinkohlenbergbauverein. Comparative measurements were obtained with both instruments and approved coal mine respirable dust samplers in several underground coal mines and in the laboratory using aerosols of coal, limestone, silica, and Arizona road dusts.

MSHA 1980 14 pp

Report No: IR 1118

Experimental Verification of the Computer Program CANOPY by the Static Testing of a Continuous Miner Canopy by Stephen G. Sawyer, Darryl K. Brogan, John L. Dahle, and George J. Karabin, Jr. (C/MNM)

Describes a test conducted on a continuous miner canopy to verify the accuracy of the computer program CANOPY previously published in Bureau of Mines Information Circular 8546. The commercially available canopy was instrumented at selected locations with strain and displacement gages, and point loaded simultaneously at 16 places. Elastic strains and displacements were recorded for a variety of load levels during both loading and unloading. The computer program analyzed the full scale test using the physical, geometrical, and sectional properties measured for the canopy's structural members.

MESA 1974 25 pp

Report No: IR 1004

Explanation of the Regional Tectonic Map of the Southwestern Coal Field of Virginia by

Thomas F. McLoughlin (C)

Compiles the major structural folds and faults into a single tectonic map for southwestern Virginia and adjacent portions of Kentucky and West Virginia.

MSHA 1986 17 pp

Report No: IR 1177

Explosion Hazard in Mining, The by John Nagy (C/MNM)

An overview of surface and underground mine ignitions and explosions. The report presents statistics on accidents and fatalities; discusses ignition sources, flame propagation, pressure development and explosion control; and compares methane and coal dust explosions.

MSHA 1981 69 pp

Report No: IR 1119

Fan Curve Preparation Using Programmable Pocket Calculators by William E. Bruce (C/MNM)

Describes an accurate programmable pocket calculator program to develop fan pressure volume curves.

MESA 1978 20 pp

Report No: IR 1070

Federal Interest in Coal Mine Waste Disposal by Donald P. Schlick (C)

Reviews the history of mine waste disposal of coal mines and documents the actions taken by the federal government to ensure the stability of coal mine waste embankments behind which water may be intentionally or inadvertently impounded and thus prevent occurrences like the Buffalo Creek Flood Disaster that occurred at Saunders, West Virginia, on February 26, 1972.

MESA 1975 15 pp

Report No: IR 1023

Field Evaluation of a Proximity Alarm Device by Richard L. Reynolds (C)

Examines the use of a proximity warning device on a crane boom to provide a warning when the boom approaches a predetermined safe distance from an energized power line. The purpose of this study was to determine the sensitivity and ruggedness of the device under field operating conditions.

MESA 1976 8 pp

Report No: IR 1035

Field Evaluations of Hearing Protection Devices at Surface Mining Environment by George Durkt Jr. (C/MNM)

This paper summarizes the results of a study conducted to evaluate the effectiveness of earmuff type hearing protection devices and their predictability when they were being worn by miners performing normal work duties.

MSHA 1994 31 pp

Report No: IR 1213

Field Evaluation of the SIMSLIN II Light Scattering Instantaneous Dust Monitor by Andrew J. Gero; A. J. Beckert; Robert A. Jonkowski and Thomas F. Tomb (C)

Presents and discusses the results of measurements made in underground coal mines with the SIMSLIN II respirable dust monitor (an instantaneous-reading dust monitor employing the principle of light-scattering to measure the mass concentration of respirable dust). Comparative measurements were obtained on coal mine dust clouds varying in particle size distribution, composition, and concentration to evaluate their effects on instrument calibration.

MSHA 1984 9 pp

Report No: IR 1153

Fifth International Labor Organization Report on the Prevention and Suppression of Dust in Mining, Tunneling and Quarrying in the United States by T. F. Tomb and L. D. Raymond (C/MNM)

Dust control practices for mining, tunneling, and quarrying in the United States from 1968 through 1972 are reviewed and summarized in this report. Also included are coal workers' pneumoconiosis statistics, administration of Federal laws governing miners' health and safety, research conducted by governmental and nongovernmental agencies and techniques for dust sampling, measurement and analysis.

MESA 1975 51 pp

Report No: IR 1027

Fracture Mechanic Approach to Understanding Supports in Underground Coal Mines by James M. Kramer; George J. Karabirs; and M. Terry Hoch

Introduces a technique for understanding supports in underground coal mines. The report describes the latest advances in software development and an in-depth example of the fracture mechanics approach. An improved yielding technique incorporating a three-stage process for strain-softening is included.

MSHA 2001 68 pp

Report No: 1263

Frictional Ignition of Methane by Continuous Mining Machines in Underground Coal Mines by Edward M. Kawenski,; George C. Price and Clete R. Stephan (C)

There was an increase in frictional ignitions from 1971 to 1976 and 90 percent of these ignitions were attributed to continuous miners. This report analyzes these frictional ignitions and makes recommendations to reduce their occurrences.

MSHA 1979 12 pp

Report No: IR 1110

Guide to Geologic Features Affecting Coal Mine Roof by Robert Lee Stahl (C)

Geologic features including concretions, clay veins, faults, fossils, channel sandstones, and rolls (all defined in the appendix) can signal hazardous roof conditions in underground coal mines. This guide is designed to be used by mine personnel as a quick reference to aid in recognizing these geologic hazards. If a geologic hazard is recognized in time appropriate corrective measures can be taken, thus reducing the likelihood of roof fall accidents and injuries.

MSHA 1979 18 pp

Report No: IR 1101

Guidelines for the Installation of MSHA-Accepted Ground Wire Monitors by Arlie B. Massey

These guidelines have been assembled in an attempt to assist inspectors in determining whether ground wire monitors are properly installed.

MSHA 1996 131 pp

Report No: IR 1241

Hazardous Waste Fuels in Mining by Metal and Nonmetal Mine Safety and Health (C/MNMM)

Discusses ways to recognize and evaluate hazards associated with the handling, storage, and use of waste fuels in mining.

MSHA 1989 19 pp

Report No: IR 1195

Heat Stress in Hot U.S. Mines and Criteria for Standards for Mining in Hot Environments by F. L. Misaqi; J. G. Inderberg; P. D. Blumenstein and T. Naiman (C/MNMM)

A comprehensive environmental study in underground and surface mines of the United States was conducted to determine the prevalent combinations of air temperature, humidity, radiative heat, and wind speed in hot mines. The study has shown that most of the surveyed mines are "hot" in terms of the existing industrial hygiene standards for hot work sites. This publication proposes standards for hot mine areas and refuge chambers; it familiarizes readers with the nature of heat stress and strain and heat-related physiological disorders; it provides information about heat stress indices, heat sources and heat control measures in mines.

MESA 1976 67 pp

Report No: IR 1048

Impact of the Metal/Nonmetal Special Accident Prevention Program for Fiscal Year 1976

by Jon Kogut (MNMM)

Examines the impact of MESA's Special Accident Prevention Program for FY 76 on the risk of disabling injury in the metal and nonmetal mining industries.

MSHA 1979 14 pp

Report No: IR 1105

Implementing Remote Sensing Techniques for Evaluating Mine Ground Stability by

Richard K. Rinkenberger (C/MNMM)

Tells how remote sensing can be applied to mine safety.

MESA 1977 36 pp

Report No: IR 1057

Improved Ignition Suppression Device for Underground Electrical Face Cutting Equipment (C)

Examines an improved ignition suppression device. This device is designed to be installed on the boom of a continuous mining machine and would function to suppress frictionally induced methane ignitions in the face areas of underground coal mines.

MSHA 1986 14 pp

Report No: IR 1175A

An Improved Prototype Ignition Suppression Device for Underground Electrical Face Cutting Equipment (C)

This report discusses an improved ignition suppression device designed to be installed on the boom of a continuous mining machine and would function to suppress frictionally induced methane ignitions in the face areas of underground coal mines.

MSHA 1988 36 pp

Report No: IR 1155

Improving Barrier Insertion Loss (C/MNM)

Details two attempts at increasing barrier insertion loss by using two different systems of resonators attached to the edges of the barrier facing the noise source. Noise control techniques developed in this report are most applicable to large stationary noise sources that contain pure tone components. Some examples of this type of noise sources in the mining industry are ventilation fans, power transformers, and vacuum pumps.

MSHA 1980 17 pp

Report No: IR 1117

In Plant Partial Noise Enclosures for the Mining Industry (MNM)

The Physical and Toxic Agents Division of the Mine Safety and Health Administration’s Pittsburgh Safety and Health Technology Center has conducted three joint noise control demonstrations at dry milling operations. These demonstrations were conducted on a rod mill, a roller mill, and a ball mill in order to survey a representative sample of the more commonly utilized types of milling equipment.

MSHA 1993 20 pp

Report No.: IR 1154

Injury Experience in Coal Mining, 1971 – 2007 by Staff, Division of Mining Information System, Health and Safety Analysis Center and Staff, Office of Injury and Employment Information, Directorate of Program Evaluation and Information Resources (C)

Reviews in detail the occupational injury and illness experience of coal mining in the United States for the years listed below. Summary reference tabulations are included at the end of the report.

1971	IR 1062	106 pp	1990	IR 1205	404 pp
1972	IR 1074	139 pp	1991	IR 1207	415 pp
1973	IR 1075	139 pp	1992	IR 1215	410 pp
1974	IR 1076	137 pp	1993	IR 1225	409 pp
1975	IR 1077	137 pp	1994	IR 1232	415 pp
1976	IR 1097	143 pp	1995	IR 1242	402 pp
1977	IR 1108	143 pp	1996	IR 1253	391 pp
1978	IR 1112	355 pp	1997	IR 1258	382 pp
1979	IR 1122	333 pp	1998	IR 1265	391 pp
1980	IR 1133	335 pp	1999	IR 1272	379 pp
1981	IR 1138	316 pp	2000	IR 1279	385 pp
1982	IR 1143	310 pp	2001	IR 1302	374 pp
1983	IR 1170	379 pp	2002	IR 1310	376 pp
1984	IR 1182	382 pp	2003	IR 1315	358 pp
1985	IR 1184	377 pp	2004	IR 1320	363 pp
1986	IR 1157	390 pp	2005	IR 1328	362 pp
1987	IR 1164	391 pp	2006	IR 1331	368 pp
1988	IR 1189	388 pp	2007	IR 1336	375 pp
			2008	IR 1341	366 pp

Injury Experience in Metallic Mineral Mining, 1970 – 2007 by Staff, Branch of Recurring Reports Health and Safety Analysis Center; Staff, Division of Mining Information System, Health and Safety Analysis Center and Staff, Office of Injury and Employment Information, Directorate of Program Evaluation and Information Resources (MNMI)

Reviews in detail the occupational injury and illness experience of metallic mineral mining in the United States for the years listed below. Summary reference tabulations are included at the end of the report.

1970-71	IR 1008	104 pp	1990	IR 1201	304 pp
1972	IR 1042	59 pp	1991	IR 1208	300 pp
1973	IR 1086	72 pp	1992	IR 1218	278 pp
1974	IR 1087	72 pp	1993	IR 1226	278 pp
1975	IR 1088	71 pp	1994	IR 1233	292 pp
1976	IR 1095	70 pp	1995	IR 1243	289 pp
1977	IR 1104	70 pp	1996	IR 1254	290 pp
1978	IR 1116	240 pp	1997	IR 1261	289 pp
1979	IR 1126	237 pp	1998	IR 1266	285 pp
1980	IR 1137	231 pp	1999	IR 1273	278 pp
1981	IR 1142	234 pp	2000	IR 1280	279 pp
1982	IR 1144	215 pp	2001	IR 1303	262 pp
1983	IR 1171	286 pp	2002	IR 1313	251 pp
1984	IR 1178	279 pp	2003	IR 1318	252 pp
1985	IR 1185	277 pp	2004	IR 1321	255 pp
1986	IR 1158	276 pp	2005	IR 1330	259 pp
1987	IR 1165	293 pp	2006	IR 1332	268 pp
1988	IR 1190	302 pp	2007	IR 1337	274 pp
1989	IR 1197	300 pp	2008	IR 1342	272 pp

Injury Experience in Nonmetallic Mineral Mining (Except Stone and Coal), 1970 – 2007 by Staff, Branch of Recurring Reports Health and Safety Analysis Center; Staff, Division of Mining Information System, Health and Safety Analysis Center and Staff, Office of Injury and Employment Information, Directorate of Program Evaluation and Information Resources (MNMI)

Reviews in detail the occupational injury and illness experience of nonmetallic mineral mining, except stone and coal, in the United States for the years listed below. Summary reference tabulations are included at the end of the report.

1970-1971	IR 1014	106 pp	1986	IR 1159	291 pp
1972	IR 1043	72 pp	1987	IR 1166	303 pp
1973	IR 1083	84 pp	1988	IR 1191	321 pp
1974	IR 1084	88 pp	1989	IR 1198	321 pp
1975	IR 1085	92 pp	1990	IR 1202	324 pp
1976	IR 1106	88 pp	1991	IR 1209	324 pp
1977	IR 1108	143 pp	1992	IR 1219	304 pp
1978	IR 1114	308 pp	1993	IR 1227	298 pp
1979	IR 1124	290 pp	1994	IR 1234	299 pp
1980	IR 1135	271 pp	1995	IR 1244	299 pp
1981	IR 1140	262 pp	1996	IR 1255	306 pp
1982	IR 1145	258 pp	1997	IR 1262	296 pp
1983	IR 1172	324 pp	1998	IR 1267	297 pp
1984	IR 1179	298 pp	1999	IR 1274	303 pp
1985	IR 1186	293 pp	2000	IR 1281	296 pp

2001	IR 1304	295 pp	2005	IR 1329	298 pp
2002	IR 1314	290 pp	2006	IR 1333	276 pp
2003	IR 1319	275 pp	2007	IR 1338	298 pp
2004	IR 1322	292 pp	2008	IR 1342	289 pp

Injury Experience in Quarrying, 1970 – 1977 by Staff, Branch of Recurring Reports Health and Safety Analysis Center and Staff, Division of Mining Information System, Health and Safety Analysis Center (MNM)

Reviews in detail the occupational injury and illness experience of quarry mining in the United States for the years listed below. Summary reference tabulations are included at the end of the report.

1970-1971	IR 1007	159 pp
1972	IR 1044	89 pp
1973	IR 1078	104 pp
1974	IR 1079	104 pp
1975	IR 1080	105 pp
1976	IR 1098	115 pp
1977	IR 1107	105 pp

Injury Experience in Sand and Gravel Mining, 1978 – 2007 by Staff, Division of Mining Information System, Health and Safety Analysis Center and Staff, Office of Injury and Employment Information, Directorate of Program Evaluation and Information Resources (MNM)

Reviews in detail the occupational injury and illness experience of sand and gravel mining in the United States for the years listed below. Summary reference tabulations are included at the end of the report.

1973	IR 1071	25 pp	1991	IR 1211	118 pp
1974	IR 1089	24 pp	1992	IR 1217	111 pp
1975	IR 1090	24 pp	1993	IR 1229	117 pp
1976	IR 1091	25 pp	1994	IR 1235	115 pp
1977	IR 1102	24 pp	1995	IR 1246	113 pp
1978	IR 1115	89 pp	1996	IR 1257	114 pp
1979	IR 1125	86 pp	1997	IR 1259	117 pp
1980	IR 1136	86 pp	1998	IR 1269	119 pp
1981	IR 1141	84 pp	1999	IR 1276	119 pp
1982	IR 1147	69 pp	2000	IR 1283	109 pp
1983	IR 1174	99 pp	2001	IR 1305	112 pp
1984	IR 1181	101 pp	2002	IR 1311	114 pp
1985	IR 1188	102 pp	2003	IR 1316	114 pp
1986	IR 1161	111 pp	2004	IR 1323	113 pp
1987	IR 1168	113 pp	2005	IR 1326	113 pp
1988	IR 1192	107 pp	2006	IR 1334	128 pp
1989	IR 1199	107 pp	2007	IR 1339	118 pp
1990	IR 1204	115 pp	2008	IR 1344	113 pp

Injury Experience in Stone Mining, 1978 – 2007 by Staff, Division of Mining Information System, Health and Safety Analysis Center and Staff, Office of Injury and Employment Information, Directorate of Program Evaluation and Information Resources (MNM)

Reviews in detail the occupational injury and illness experience of stone mining in the United States for the years listed below. Summary reference tabulations are included at the end of the report.

1978	IR 1113	373 pp	1994	IR 1236	512 pp
1979	IR 1123	410 pp	1995	IR 1245	521 pp
1980	IR 1134	400 pp	1996	IR 1256	528 pp
1981	IR 1139	380 pp	1997	IR 1260	527 pp
1982	IR 1146	343 pp	1998	IR 1268	537 pp
1983	IR 1173	431 pp	1999	IR 1275	533 pp
1984	IR 1180	441 pp	2000	IR 1282	539 pp
1985	IR 1187	441 pp	2001	IR 1306	524 pp
1986	IR 1160	450 pp	2002	IR 1312	530 pp
1987	IR 1167	478 pp	2003	IR 1312A	525 pp
1988	IR 1193	499 pp	2004	IR 1324	536 pp
1989	IR 1200	512 pp	2005	IR 1327	547 pp
1990	IR 1203	510 pp	2006	IR 1335	532 pp
1991	IR 1210	521 pp	2007	IR 1340	538 pp
1992	IR 1216	517 pp	2008	ir 1345	537 pp
1993	IR 1228	509 pp			

Interpreting the State of a Mine Fire by Donald W. Mitchell and Frank A. Burns (C)

Success in controlling a mine fire depends to a large measure on decision making. Reliable information is essential to answer the critical questions: (1) What is the danger of explosion? (2) Can the firefighters move to safe areas before an explosive atmosphere develops? (3) Are the firefighting techniques effective? (4) Is the fire under control? Ways to develop this information for decision makers are described. Advice and rules based on experiences at many mine fires are given.

MSHA 1979 18 pp

Report No: IR 1103

Investigation of the Effects of Thrust and Hardened Washers on the Installed Tension of a Roof Bolt by Stephen G. Sawyer, George J. Karabin, and William J. Debevec (MNM)

Describes the results of a project to study the effects of thrust and hardened washers on the installed tension in a roof bolt.

MESA 1976 18 pp

Report No: IR 1031

Introduction to Operator Air Sampling Programs by Doris A. Cash

The first in a series of reports assisting mine operators in determining the adequacy of their control measures and in planning for effective monitoring of their employees' exposure to silica dust and other airborne contaminants.

MSHA 1999 23 pp

Report No: IR 1250

Laboratory and Field Evaluation of Instantaneous Reading Dust Instruments (C)

Describes a study conducted to evaluate two instantaneous reading dust monitors that use the attenuation of beta rays to determine respirable mass dust concentration.

MSHA 1984 16 pp

Report No: IR 1148

Laboratory Evaluation of a Commercially Available Underground Dry Dust Collection System (C)

Describes a laboratory evaluation conducted to determine the dust collection efficiency of an auxiliary blower fan with integral dry dust collection.

MSHA 1984 8 pp

Report No: IR 1150

Laboratory Evaluation of RACAL "Airstream" Helmet (C)

An "airstream" safety helmet designed to provide head, face and respiratory protection in dust-laden environments was marketed. Because the helmet has the potential to provide acceptable personal protection, a laboratory study was conducted to ascertain the feasibility of its use in selected mining operations. Although the helmet would provide adequate protection from particulates generated during typical coal mining operations, adequate protection may not be provided when used in atmospheres with high silica content.

MSHA 1981 7 pp

Report No: IR 1130

Laboratory Evaluation of Sound Pressure Levels Generated Inside the Earcups of Active Hearing Protection Devices by George Durkt Jr. (C/MNM)

The purpose of this evaluation was to assess the performance of several active hearing protection devices (AHPDs) and one passive device to determine if these types of protectors are appropriate for use in a mine operator's hearing conservation program (HCP).

MSHA 2006 25 pp

Report No: IR 1325

Laboratory Evaluation of the Leitz Tyndallometer TM-Digital by Thomas F. Tomb, Harry N. Treaftis, and Eileen M. Thompson (C)

A laboratory study was conducted to evaluate a new instantaneous reading respirable dust monitor.

MESA 1977 7pp

Report No: IR 1051

Magnitude of the Noise-Induced Hearing Loss Problem in the Mining Industries by Michael P. Valoski

This study attempts to quantify the magnitude of the noise-induced hearing loss (NIHL) problem in the mining industries. The analysis demonstrates conclusively that NIHL is a major health problem affecting the mining industries.

MSHA 1994 20 pp

Report No: IR 1220

Mandatory Safety and Health Training of Miners, Provisions in the New Federal Act and a Review of German, British and Polish Programs by Shepich, T. J., D. P. Schlick and K. Thirurnala (C/MNM)

Examines mandatory training of miners and makes suggestions for instituting similar training in the

United States under the provisions of the 1977 Act.

MSHA 1978 24 pp

Report No: IR 1082

Material Instability Hazards in Mine-Processing Operations by John W. Fredland; Dr. Kelvin K. Wu and Donald W. Kirkwood

Many accidents occur in the mining industry because of instability of material during handling and processing operations. This report provides information on safe working procedures at stockpiles and surge piles.

MSHA 1994 10 pp

Report No: IR 1212

Measurements of Some of the Factors Which Influence the Radon Daughter Health Hazard

by Robert L. Rock and Robert T. Beckman (MNM)

Describes 5 studies done by MESA in 1973 and 1974 to determine conditions influencing radon daughter concentrations and percentages of unattached daughter atoms.

MESA 1977 12 pp

Report No: IR 1067

Meeting Mandatory Federal Health Standards Under Difficult Dust Control Conditions by John J. Pendergast; Titus A. Cox and William H. Sutherland (C)

Respirable dust measurements made by coal mine inspectors during the first year of enforcement of the Coal Mine Health and Safety Act of 1969 established that the high risk dust concentrations on the four longwall plows operating in Virginia were in the range of 6 to 12 milligrams of respirable dust per cubic meter of air (MG/M³). This report outlines chronologically the use of several sets of dust control methods that resulted in reductions in respirable dust levels.

MESA 1976 28 pp

Report No: IR 1032

Methods Factors for Anemometer Readings at Tubing Inlets by Robert A. Haney and Thomas C. Hlavsa (C/MNM)

Describes how accurate air velocity measurements have been obtained by applying a methods factor to vane anemometer readings at the inlet of an exhaust tubing installation.

MESA 1976 9 pp

Report No: IR 1041

Mine Emergency Operations of the Mining Enforcement and Safety Administration by Donald P. Schlick (C/MNM)

Describes the circumstances and actions which created the mine emergency operations group of MESA in 1971. It discusses the purpose, equipment, and operation of this group and procedures that must be followed.

MESA 1975 61 pp

Report No: IR 1011

Mine Engineering and Ventilation Problems Unique to the Control of Radon Daughters

(MNM) by Robert L. Rock

Discusses the principal methods of utilizing mine planning to facilitate radon-daughter control and also treats the more subtle features of mine ventilation which are especially critical in the ventilation of

mines where radon gas constitutes an environmental contamination problem.

MESA 1974 11 pp

Report No. IR 1001

Mine Refuse Impoundments in the United States by D. P. Schlick and W. A. Wahler (C/MNM)

Examines technological changes in the U.S. and their impact upon mine refuse impoundments.

MESA 1977 (Rev) 41 pp

Report No: IR 1028

Mine Rescue Study Report on Australian Mine Rescue Systems and a Discussion of American Systems with Recommendations by Jack E. Tisdale (C)

Examines different mine rescue systems used in Australia and compares these methods to those used in the United States.

MESA 1977 31 pp

Report No: IR 1063

Mine Ventilation Digital Simulation and Analysis Capabilities at MESA's Denver Technical Support Center by Thomas C. Anderson and David Dvorkin (C/MNM)

The capability of solving complex mine ventilation network simulations has existed for many years. This report summarizes the implementation of this capability for use by MESA's Denver Technical Support Center (DTSC) Ventilation Branch. Listings of the programs used in the modeling of ventilation networks and documentation for use of the programs are provided. Usage of data and ventilation simulation as a service by Denver Technical Support Center is explained.

MESA 1978 108 pp

Report No: IR 1066

Mine Ventilation Pressure Differentials with a Programmable Hand Calculator by Thomas C. Anderson and Joseph W. Nugent (C)

Mine ventilation pressure differentials are calculated by various existing methods, including chart and slide rule manipulation, electronic desk calculators, and computers. This report shows that the speed and accuracy of a desk calculator can be matched with a programmable hand calculator in a field situation requiring mobility.

MESA 1977 29 pp

Report No: IR 1050

Monitoring and Warning Instrumentation of Pillar Movements in Salt by M. L. Ellickson (MNM)

Describes a study of lateral deformation in salt pillars. The object of the study was to forewarn mining personnel of possible excessive deformation of pillar ribs which could damage timbers at the shaft bottom.

MESA 1977 11 pp

Report No: IR 1055

Monitoring Radon 222 Content of Mine Waters by Fazlollah L (Leo). Misaqi (C/MNM)

Deals with sampling and radiometric analysis of mine waters for Radon 222. The purpose of this publication is to assist mine health specialists and safety engineers in setting up a practical program for analysis and control of Radon 222 originating from ground waters.

MESA 1975 18 pp

Report No: IR 1026

MSHA Test Procedures and Acceptability Criteria for Noise Dosimeters by Dennis A. Giardino, John P. Seiler, and Timothy Y. Yen (C)

A test procedure and criteria were needed by MSHA to evaluate commercially available noise dosimeters. Since there were no recognized standard test procedures and criteria for the noise dosimeter, it was necessary for MSHA to adopt its own. The adopted test procedures were developed jointly between the U.S. Bureau of Mines and MSHA, while the adopted criteria were developed solely by MSHA. A full presentation of the procedures and initial test results may be found in the U.S. Bureau of Mines Information Circular 8754 titled "Noise Dosimeter Performance-- a Second Evaluation" by Timothy Y. Yen and Kenneth C. Stewart.

MSHA 1978 11 pp

Report No: IR 1072

MSHA's Procedure for Determining Quartz Content of Respirable Coal Mine Dust (C)

In accordance with Section 205 of the 1969 Federal Coal Mine Safety and Health Act, MSHA instituted a program to establish an applicable respirable dust standard when the quartz content of respirable dust in the mine atmosphere was more than 5 percent. In 1981 the analytical method was modified, permitting a quartz determination to be made on a sample containing as little as 0.5 mg of respirable coal mine dust. Paper discussed the modifications made to the analytical procedure.

MSHA 1984 13 pp

Report No: IR 1152

Natural Draft: Its Measurements and Modeling in Underground Mine Ventilation Systems by William E. Bruce (C)

Intended to provide an improved understanding of natural draft (natural ventilating pressure) and the effect of natural draft on underground mine ventilation circuits. Attention is focused on measurement of natural draft pressures during ventilation surveys in mechanically ventilated mines and on different methods for modeling natural draft using the measured data.

MSHA 1986 34 pp

Report No: IR 1183

Noise Control of an Underground Continuous Miner, Auger-Type by Dennis A. Giardino, Thomas G. Bobick, and Leonard C. Marraccini (C)

Describes the noise control modifications made on a Wilcox Mark 20 underground auger miner and related bridge conveyor. Sufficient detail is given so that interested parties can use the report as a manual for conducting similar modifications.

MESA 1977 56 pp

Report No: IR 1056

Noise Dosimeters: Past, Present, and Future by Dennis A. Giardino and John P. Seiler (C/MNM)

Deals with the design, evaluation, usage, and future of personal noise dosimeters.

MESA 1976 11 pp

Report No: IR 1049

Noise Environment of the Underground Coal Mine, (The) by Thomas G. Bobick and Dennis A. Giardino (C)

Describes a series of environmental noise surveys conducted in 12 underground coal mines. More than 2,600 employees were included in this survey. Analysis of the data indicates that 7 percent of this total,

including 20 percent of all face workers, are exposed to noise levels which are in excess of the prescribed limits set by the Federal Coal Mine Health and Safety Act of 1969. A projection of the effect that revisions in the noise standards would have on the coal mining industry is also presented.

MESA 1976 26 pp

Report No: IR 1034

Noise Exposure in U. S. Coal Mines by J.P. Seiler; M.P. Valoski and M.A. Crivaro

This paper presents the mean and standard deviation of over 60,000 full-shift noise dose measurements for various underground and surface coal mining occupations. The report also compares and contrasts the levels with historical noise exposure measurements for selected coal mining occupations that were published in the 1970s.

MSHA 1994 40 pp

Report No. IR 1214

Noise in the Mining Industry – An Overview (C)

A survey of noise found in coal mining. Examples of proven noise controls for mining are included.

MSHA 1981 10 pp

Report No: IR 1129

Operational Analysis of Point Resin-Anchored Bolting Systems, An by George J. Karabin, Jr. and M. Terry Hoch (C)

Traces the development of and theory behind resin-anchored tensioned bolts; documents both laboratory and underground demonstrations of their effectiveness; and finally, suggests installation guidelines through which the most efficient use of these systems can be achieved.

MSHA 1979 14pp

Report No. IR 1100

Panic Bars and Automatic Brakes by Cecil E. Lester (C)

Contains drawings depicting actual fatal accidents that have occurred in underground coal mines which panic bars and automatic brakes could have prevented. Also included are drawings and technical data to be used to assist mining companies and equipment manufacturers in the design, installation, and maintenance of panic bars and automatic brakes.

MESA 1975 24 pp

Report No: IR 1012

Permissible Electric Face Equipment and Other Mine Equipment Approved From January 1969 through December 1974 by F. R. Lee (C/MNM)

Lists permissible mine equipment, except respiratory protective apparatus and explosives, approved by the Bureau of Mines and MESA from January 1, 1969, through December 31, 1974, for use in underground coal and gassy noncoal mines. It also lists mobile diesel-powered equipment approved for underground noncoal mines. (A Supplement to Bureau of Mines Bulletin 543 and Bureau of Mines Information Circulars 8220, 8299, 8372, and 8463)

MESA 1977 87 pp

Report No: IR 1053

Piping Methane in Underground Coal Mines by Jack E. Tisdale, Donald W. Mitchell; Robert A. Elam, Jack E. Tisdale; Michael J. Lawless and Bernard E. Taylor (C)

Examines a method for degasifying coalbeds and piping the methane to the surface.

MSHA 1978 34 pp

Report No: IR 1094

Presentations from the 1992 Coal Mining Impoundment Informational Meeting by Office of Technical Support

This report contains 15 presentations about issues involved in design and construction of dams associated with coal mining. Conference held May 20-21, 1992, at the National Mine Health and Safety Academy, Beckley, West Virginia.

MSHA 1993 175 pp

Report No: IR 1206

Progress of Mine Systems in Australia (C)

Investigates mining in Australia with special emphasis on shortwall mining and pillar recovery in underground coal mines, reclamation of mined areas at strip coal and noncoal mines, and mine rescue operations. The report includes a description of Australian geology and mining operations and offers recommendations for consideration and action – principally by MESA.

MESA 1975 16 pp

Report No: IR 1006

Quality Assurance Program for Field Health Laboratories (C)

Describes the quality assurance program conducted by MSHA to ensure performance integrity of field laboratories in the maintenance and calibration of respirable dust sampling equipment and the weighing of respirable coal mine dust samples.

MSHA 1984 18 pp

Report No: IR 1149

Quantitating Respirable Dust Levels Generated During Longwall Mining Operations by R. Lindsay Mundell and Charles D. Taylor (C)

During recent years, use of longwall methods to mine coal in the United States has steadily increased. Although this mining method offers several advantages, health hazards often prevail because of excessive respirable dust levels. This paper summarizes the data collected during 10 environmental dust surveys of longwall mining sections throughout the United States from 1971 to 1974. Respirable dust levels associated with specific mining occupations, production and engineering controls affecting respirable dust concentrations, and sources of dust generation are discussed.

MESA 1977 27 pp

Report No: IR 1061

Radon Daughter Growth With Continuous Radon Influx and Various Ventilation Rates by Robert T. Beckman and Robert F. Holub (MNM)

Determines the effects of continuous radon influx with various ventilation rates. The use of the curves presented in this report will give a more realistic estimation of the conditions present and better rationale for ventilation changes.

MSHA 1979 14 pp

Report No: IR 1099

Radon-Daughter Slide Rule by Robert T Beckman. and Robert L. Rock (MNM)

Describes a slide rule designed and fabricated to simplify radon-daughter computations made by the Kusnetz and Rolle methods. The purpose of this publication is to describe this slide rule, its advantages, and operation. This slide rule provides an easy, rapid, accurate method of computing radon daughter sampling results and replaces the tables, nomographs, and manual methods of calculation in use.

MESA 1974 11 pp

Report No: IR 1003

Reducing the Noise Generated during Air-Arc Gouging can be as Simple as Flipping a Switch by George Durkt Jr.

(MSHA) has been evaluating the job/task of air-arc gouging performed by mine shop welders. Air-arc gouging is the process of melting an old weld with a carbon based electrode (rod) and blowing the molten metal away with compressed air. Noise levels of 115 dBA or higher can be generated in this process. Three acoustical field evaluations were conducted at mine shops comparing both Constant Current (CC) and Constant Voltage (CV) techniques for air-arc gouging.

MSHA 2010 16 pp

Report No.: IR 1347

Regional Enforcement of Mine Safety and Health Regulations and Miner Education and Training in the Federal Republic of Germany by D. P. Schlick and K. Thirumala (C)

A regional system of mine safety and health enforcement works effectively in the Federal Republic of Germany. This report discusses some salient features of the regional mining enforcement system in the Federal Republic of Germany and the interactions between the regional mine enforcement and operator funded institutions that provide technical support and miner training.

MSHA 1978 13 pp

Report No: IR 1093

Requirements for Roll-Over Protective Structures and Falling Object Protective Structures for Surface Coal Mines and Surface Areas of Underground Coal Mines by Edward E. Hollop (C)

The development of MESA's roll-over protective structures (ROPS) and falling object protective structures (FOPS) regulations and the appropriate adopted standards are presented in this report. Accident statistics gathered from the mining industry which point out the need for ROPS and FOPS on surface mining equipment are included. Appendices to the report give the adopted standards and MESA's regulations covering ROPS and FOPS.

MESA 1977 56 pp

Report No: IR 1036

Respirable Coal Mine Dust Sample Processing (C)

Describes the changes in the respirable coal mine dust sampling program and the equipment and procedures used by MSHA to process respirable coal mine dust samples collected in accordance with regulatory requirements.

MSHA 1987 23 pp

Report No: IR 1156

Respirable Dust Control and Assessment in the Mines of the United Kingdom by T. F. Tomb and R. L. Mundell (C)

Discusses British coal dust control practices and trends in research that have potential application in the United States. Ventilation, application of water, dust reduction through machine design, and the use of dust collection devices are covered. Current and proposed dust standards for underground work places are discussed.

MESA 1975 15 pp

Report No: IR 1030

Respirable Dust Control on Longwall Mining Operations in the United States (C) Describes results of respirable dust studies conducted on United States longwall mining operations in 1972 and 1978. Prevalent engineering control methods (ventilation, water application, and use of machine cutting parameters) and administrative controls for minimizing employees' respirable dust exposures are discussed. Reviews research efforts for control of respirable dust on longwall mining operations.

MSHA 1984 24 pp

Report No: IR 1151

Respirable Mine Dust Sample Processing Laboratory by Paul S. Parobeck (C)

Describes the Respirable Mine Dust Sampling Laboratory in Pittsburgh, Pennsylvania.

MESA 1976 13 pp

Report No: IR 1045

Review of Published Experimental Calibrations Performed on the 10 Millimeter Nylon Cyclone by Thomas F. Tomb and Harry N. Treaftis (C/MNM)

Presents a review of all the investigative work that has been conducted on the calibration of the 10mm Dorr-Oliver nylon cyclone for the purpose of recommending an operational flow rate for the 110mm cyclone that will provide size-selection characteristics that most closely approximate the Atomic Energy Commission (AEC) respirable dust criterion.

MESA 1976 13 pp

Report No: IR 1040

Sampling Mine Atmospheres for Potential Alpha Energy Due to the Presence of Radon-220 (Thoron) Daughters by R. L. Rock (MNM)

Describes the decay characteristics of thoron and its daughters, and presents a simple field method for testing for the presence of thoron daughters. Where such a test proves positive, the procedure for determining potential alpha energy (working levels) from thoron daughters is given.

MESA 1975 15 pp

Report No: IR 1015

Sandstone Channels: Their Influence on Roof Control in Coal Mines by Kirk W. McCabe and William Pasco (C)

This investigative study of sandstone channels reveals 15 key characteristics that are diagnostic. Early detection of channels combined with the proper corrective measures have resulted in improved safety conditions in sections where channels disturbed the roof. This report discusses in detail the 15 key characteristics of sandstone channels. Many of these identifying characteristics are emphasized in a section on specific mine investigations, in which actual examples of roof control problems are accompanied by workable solutions.

MSHA 1978 24 pp
Report No: IR 1096

Standard Calibration and Maintenance Procedures for Wet Test Meters and Coal Mine Respirable Dust Samplers by Thomas F. Tomb and Harry N. Treaftis (C)

Presents the standard procedures used by MSHA for calibration of currently approved personal samplers and associated equipment and maintenance procedures for the equipment. Superseded by IR 1121.

MSHA 1978 14 pp
Report No: IR 1073

Study on Underground Auger Mining Hazards by R. H. Oitto and R. R. McLellan (C)

Concludes that fatalities caused directly by underground auger machines have decreased significantly but not because the hazards from auger machines have been lessened. Rather, the exposure time to the hazards has been decreased through emphasis on safer operating procedures and because many underground auger mines have closed.

MESA 1975 11 pp
Report No: IR 1010

Summary of Selected Injury Experience and Worktime for the Mineral Industry in the United States, 1931 – 1977 (C/MNM)

Summarizes principal injury experience and worktime measures of workers of U.S. mining and milling operations for the period 1931-1977. The data are arranged in 39 tables.

MSHA 1984 69 pp
Report No: IR 1132

Summary of Some Selected Underground Coal Mine Face Machinery Fatalities – 1973 by G. A. Wancheck (C)

This descriptive summary is based on Federal coal mine inspectors' reports of face machinery fatalities for the year 1973. The purpose is to determine the cause of each fatality with respect to the equipment involved in each. The report is primarily designed for use in the safety education and training of mining personnel.

MESA 1975 23 pp
Report No: IR 1029

Testing Procedure for the Certification of Underground Protective Cabs and Canopies, A by Stephen G. Sawyer and Darryl K. Brogan (C/MNM)

Describes a step-by-step procedure for testing cabs and canopies. The results of the test are usually conservative because factors of safety have been introduced to compensate for a loss of accuracy which must occur to gain simplicity in testing.

MESA 1974 15pp
Report No: IR 1002

Trouble-Shooting Guide for Roof Support Systems, A by Raymond A. Mazzoni; George J. Karabin and Joseph A. Cybulski

Provides a logical sequence to resolving the most common problems encountered with roof supports.

MSHA 1996 104 pp
Report No: IR 1237

Underground Noise Interference Effects of the Personal Respirable Coal Mine Dust Sampler (C)

Examines the noise interference effects of the Mine Safety Appliance (MSA) and Bendix personal respirable coal mine dust samplers. The noise radiated by these devices is characterized and compared to underground warning signals and voice communication signals. The health hazard potential for hearing loss due to dust sampler noise is also examined.

MSHA 1981 7 pp

Report No: IR 1127

Use of a Handheld Programmable Calculator to Determine the Explosibility of Mine Atmospheres and Gas Mixtures, The by G. E. Smith and J. W. Nugent (C/MNM)

Presents two programs for determining the combustibility of gas mixtures utilizing a handheld programmable calculator. The first program is adapted from the calculations presented in Bureau of Mines Information Circular 7901. The calculations are modified in part to expand their usage to include paraffin hydrocarbons. The second program uses Le Chatelier's Law for determining the total combustible gas.

MESA 1977 13 pp

Report No: IR 1069

Use of Aircraft Imagery in Evaluating Ground Stability at Open Pit Uranium Mines in Gas Hills, Wyoming (MNM)

Describes the use of aircraft imagery to identify geologic features which can affect ground stability in surface mines. The remote sensing tool is inexpensive, accurate, and rapid.

MSHA 1983 12 pp

Report No: IR 1131

Ventilation Measurements at Underground Mine Regulators (C/MNM)

Discusses two practical and accurate methods for computing the air volumes passing through underground mine regulators and rectangular openings in stoppings.

MSHA 1981 13 pp

Report No: IR 1128

Ventilation to Control Smoke from a Fireproof Structure by Joseph D. Hadden, Robert I. Smith, Steven J. Luzik, and Earl C. Seiler (C)

Tests were performed to measure the ventilation parameters, under practical circumstances, required to prevent smoke from a fire within an enclosure (ventilated to the mine return) from reversing through the intake air opening and contaminating the intake air course. The results of these experiments show that, under test conditions, the flow of smoke from an enclosure can be controlled by ventilating and that practical anemometer measurements can be used to determine the adequacy of system control.

MESA 1977 15 pp

Report No: IR 1054

Wet Auger: Respirable Dust Control for Underground Auger Continuous Mining Machines by John J. Pendergast; Willis D. Ison and William H. Sutherland, (C)

Describes a through-auger spray system which has reduced the average respirable dust concentrations of the return-side Jacksetter (high-risk occupation), and the milligrams of airborne respirable dust generated from each ton of coal produced, by more than 60 percent.

MESA 1975 8 pp

Report No: IR 1013

Informational Reports Index by Subject

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Impact of the Metal/Nonmetal Special Accident Prevention Program for Fiscal Year 1976 (IR 1105)

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Determining the Quartz Content of Respirable Dust by FTIR (IR 1169)

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Analysis of Fatal Accidents Involving Front-End Loaders at Metal and Nonmetal Mines, 1972 - 1974 (IR 1019)

Analysis of Haulage Truck Visibility Hazards at Metal and Nonmetal Surface Mines, 1975 (IR 1038)

Analysis of Injuries Associated With Maintenance and Repair in Metal and Nonmetal Mines (IR 1058)

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Injury Experience in Coal Mining, 1971 – 2007 by Staff, Branch of Injury and Employment Information, Health and Safety Analysis Center, and Staff, Office of Injury and Employment Information, Directorate of Program Evaluation and Information Resources (**IR**)

1971	IR 1062	1990	IR 1205
1972	IR 1074	1991	IR 1207
1973	IR 1075	1992	IR 1215
1974	IR 1076	1993	IR 1225
1975	IR 1077	1994	IR 1232
1976	IR 1097	1995	IR 1242
1977	IR 1108	1996	IR 1253
1978	IR 1112	1997	IR 1258
1979	IR 1122	1998	IR 1265
1980	IR 1133	1999	IR 1272
1981	IR 1138	2000	IR 1279
1982	IR 1143	2001	IR 1302
1983	IR 1170	2002	IR 1310
1984	IR 1182	2003	IR 1315
1985	IR 1184	2004	IR 1320
1986	IR 1157	2005	IR 1328
1987	IR 1164	2006	IR 1331
1988	IR 1189	2007	IR 1336
1989	IR 1196		

Injury Experience in Nonmetallic Mineral Mining (Except Stone and Coal), 1970 – 2007 by Staff, Branch of Recurring Reports Health and Safety Analysis Center and Staff, Office of Injury and Employment Information, Directorate of Program Evaluation and Information Resources (IR)

1970-1971	IR 1014	1991	IR 1209
1972	IR 1043	1992	IR 1219
1973	IR 1083	1993	IR 1227
1974	IR 1084	1994	IR 1234
1975	IR 1085	1995	IR 1244
1976	IR 1108	1996	IR 1255
1978	IR 1114	1997	IR 1262
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1981	IR 1140	1999	IR 1274
1982	IR 1145	2000	IR 1281
1983	IR 1172	2001	IR 1304
1984	IR 1179	2002	IR 1314
1985	IR 1186	2003	IR 1319
1986	IR 1159	2004	IR 1322
1987	IR 1166	2005	IR 1329
1988	IR 1191	2006	IR 1333
1989	IR 1198	2007	IR 1338
1990	IR 1202		

Injury Experience in Quarrying, 1970 – 1977 by Staff, Branch of Recurring Reports Health and Safety Analysis Center and Staff, Division of Mining Information System, Health and Safety Analysis Center (IR)

1970-1971	IR 1007
1972	IR 1044
1973	IR 1078
1974	IR 1079
1975	IR 1080
1976	IR 1098
1977	IR 1107

Injury Experience in Sand and Gravel Mining, 1973 – 2007 by Staff, Division of Mining Information Systems, Health and Safety Analysis Center and Staff, Office of Injury and Employment Information, Directorate of Program Evaluation and Information Resources **(IR)**

1973	IR 1071	1991	IR 1211
1974	IR 1089	1992	IR 1217
1975	IR 1090	1993	IR 1229
1976	IR 1091	1994	IR 1235
1977	IR 1102	1995	IR 1246
1978	IR 1115	1996	IR 1257
1979	IR 1125	1997	IR 1259
1980	IR 1136	1998	IR 1269
1981	IR 1141	1999	IR 1276
1982	IR 1147	2000	IR 1283
1983	IR 1174	2001	IR 1305
1984	IR 1181	2002	IR 1311
1985	IR 1188	2003	IR 1316
1986	IR 1161	2004	IR 1323
1987	IR 1168	2005	IR 1326
1988	IR 1192	2006	IR 1334
1989	IR 1199	2007	IR 1339
1990	IR 1204		

Injury Experience in Stone Mining, 1978 - 2007 by Staff, Office of Injury and Employment Information, Directorate of Program Evaluation and Information Resources **(IR)**

1978	IR 1113	373 pp	1994	IR 1236	512 pp
1979	IR 1123	410 pp	1995	IR 1245	521 pp
1980	IR 1134	400 pp	1996	IR 1256	528 pp
1981	IR 1139	380 pp	1997	IR 1260	527 pp
1982	IR 1146	343 pp	1998	IR 1268	537 pp
1983	IR 1173	431 pp	1999	IR 1275	533 pp
1984	IR 1180	441 pp	2000	IR 1282	539 pp
1985	IR 1187	441 pp	2001	IR 1306	524 pp
1986	IR 1160	450 pp	2002	IR 1312	530 pp
1987	IR 1167	478 pp	2003	IR 1312A	525 pp
1988	IR 1193	499 pp	2004	IR 1324	536 pp
1989	IR 1200	512 pp	2005	IR 1327	547 pp
1990	IR 1203	510 pp	2006	IR 1335	532 pp
1991	IR 1210	521 pp	2007	IR 1340	538 pp
1993	IR 1228	509 pp			

Summary of Selected Injury Experience and Worktime for the Mineral Industry in the United States, 1931-1977 (IR 1132)

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Comparison of Infrared Absorbances for Standard Samples Prepared From Sieved and Nonsieved Quartz Reference Materials (IR 1223)
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Fifth International Labor Organization Report on the Prevention and Suppression of Dust in Mining, Tunneling and Quarrying in the United States (IR 1027)
Introduction to Operator Air Sampling Programs (IR 1250)
Review of Published Experimental Calibrations Performed on the 10 Millimeter Nylon Cyclone (IR 1040)

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Mine Rescue Study Report on Australian Mine Rescue Systems and a Discussion of American Systems with Recommendations (IR 1063)

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Mine Engineering and Ventilation Problems Unique to the Control of Radon Daughters (IR 1001)

Mine Ventilation Digital Simulation and Analysis Capabilities at MESA's Denver Technical Support Center (IR 1066)

Mine Ventilation Pressure Differentials with a Programmable Hand Calculator (IR 1050)

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