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16. Abstract (Limit: 200 words) This statement concerned mine health research and technical assistance programs sponsored by NIOSH. NIOSH conducted research directed toward protection of life and health, detection of respiratory impairment, and prevention of occupational diseases of coal miners. NIOSH also established coal mine health standards and assures the availability of medical examinations for underground coal miners. NIOSH cooperated in a joint program to test and certify respirators and coal mine dust personal samplers. Miners suffer from various work hazards including exposure to coal dust, radiation and excessive noise levels. There was also evidence of increased mortality due to lung cancer and stomach cancer. There was inadequate data on the degree of exposure to many of the hazards present in the mines. Workers in nonmetal mines and mills were exposed to an even wider range of pneumoconiosis producing dusts than were coal miners. Health standards have been promulgated by the Department of the Interior for metal and nonmetal mining operations. NIOSH was engaged in cooperative research with other agencies to help ensure the future safety of miners.

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Statement of

Edward J. Baier, Deputy Director
National Institute for Occupational Safety and Health
Center for Disease Control
Department of Health, Education, and Welfare

Before the
Subcommittee on Compensation, Health and Safety
House Committee on Education and Labor

April 4, 1977

Mr. Chairman and Members of the Subcommittee:

I am Edward J. Baier, Deputy Director of the National Institute for Occupational Safety and Health (NIOSH). Before accepting the position as Deputy Director of NIOSH in 1972, I was Director of the Bureau of Mines and Occupational Health and Safety for the Pennsylvania Department of Environmental Resources. Accompanying me today are the Director of our Appalachian Laboratory for Occupational Safety and Health (ALOSH), Dr. James A. Merchant, and the Associate Director, Mr. Earle P. Shoub. We welcome the opportunity to appear before you today to discuss our mine health research and technical assistance programs and to express our support for your efforts to emphasize the importance of protecting the health as well as the safety of the miner in amending existing Federal mine legislation. The Department will be submitting detailed comments on H.R. 4287 in a letter to the Chairman.

NIOSH MINING RESPONSIBILITIES

Under the Federal Coal Mine Health and Safety Act of 1969 (Coal Mine Act), NIOSH conducts research directed toward protection of life, and health, detection of respiratory impairment, and prevention of occupational diseases of coal miners. We also establish coal mine health standards and assure the availability of medical examinations for underground coal miners. The Mining Enforcement and Safety Administration (MESA) of the Department of the Interior establishes coal mine safety standards and enforces both health and safety standards. Under the Coal Mine Act, NIOSH has joint regulations with MESA to test and certify respirators and coal mine dust personal samplers. Under

this program, our Testing and Certification Branch conducts all the tests on respirators and personal samplers with the exception of any electrical components. Electrical safety tests are conducted by MESA. Certified equipment receives approval labels both from NIOSH and MESA. Under authority of the Occupational Safety and Health Act of 1970, the Testing and Certification Branch has promulgated independent regulations to test and certify sound level meters and gas detector tubes. As part of our research program under the Occupational Safety and Health Act, NIOSH also tests and reports on a wide variety of other environmental monitoring and personal protective equipment for conformance with OSHA standards and other performance criteria.

Currently, NIOSH has no legislated responsibility under the Federal Metal and Nonmetallic Mine Safety Act (the Metal Mine Act). Over the years, however, NIOSH and its predecessor organizations have conducted considerable research into the health hazards of metal and non-metal mines under authority of the Public Health Service Act. Under the Occupational Safety and Health Act of 1970, our Institute has developed recommended standards which are also applicable to some of the most important health hazards facing workers in metal mines, including noise, asbestos, silica, beryllium, inorganic arsenic, inorganic mercury, carbon monoxide, oxides of nitrogen and phenol.

The total NIOSH budget for fiscal year 1977 is $48.8 million. About $2.1 million of this budget has been allocated to coal mine health research and another $2.1 million for related services to coal miners and mine operators. NIOSH conducts more research on occupational health

problems of coal miners than on any other single occupational group. In addition, about $200,000 was spent on research that could be related to hazards found in metal and non-metal mines.

HEALTH HAZARDS OF MINING

Mining has always been known to be a dangerous occupation from the safety viewpoint, and even today ranks among the highest in incidence and severity of accidents. It is more difficult to get people to see and understand the health hazards of mining. It is almost a century and a half since the British began to recognize that an occupational disease could result from the inhalation of coal mine dust. It was not until the 1940's, however, that the British began to define coal workers' pneumoconiosis as a disease entity distinct from the classic dust disease, silicosis. It took even longer to accept that American bituminous coal as well as anthracite miners suffered from occupationally related chest diseases. Studies conducted by the Pennsylvania Department of Health in the late 1950's and by the Public Health Service in the early 1960's confirmed the existence of widespread pneumoconiosis among American coal workers. In addition to coal workers' pneumoconiosis, coal miners have been shown to suffer more respiratory impairment and disability than the general population. Coal miners also commonly suffer hearing impairment or loss as a result of exposure to excessive noise. The University of Pittsburgh Graduate School of Public Health recently completed a study under contract with NIOSH that examined the cause of death of over 23,000 coal miners. The study shows significant excess deaths from respiratory disease,

accidents, and lung cancer. The study also shows excess deaths from stomach cancer.

We will begin the third round of the National Study of Coal Worker's Pneumoconiosis this fiscal year. The first two national studies were conducted from 1969 to 1971 and 1972 to 1975 in selected mines. Although approximately 10,000 miners in each of these studies were examined by medical teams from our Morgantown laboratory, we had to rely on information previously collected for regulatory purposes to estimate the dust levels to which the miners had been exposed. In the third round, in addition to medically examining the miners, we will also collect dust samples reflecting current coal mine dust levels. The National Study is an important mechanism to monitor the prevalence of disease among coal miners.

NIOSH has also provided technical assistance to evaluate specific exposures in coal mines. At the request of miner representatives, NIOSH has investigated problems of exposure to heat stress, creosote, asbestos, and resins used in roofbolting.

The approximately 260,000 workers in metal and non-metal mines extract about 50 commodities, including copper, mercury, gold, silver, lead, zinc, uranium, and asbestos. These miners are exposed to more than a hundred additional potentially toxic substances and harmful physical agents during mining processes. Adequate information does not exist on the levels at which most of these substances are present in mines.

As a group, workers in metal and non-metal mines and mills are exposed to an even wider range of pneumoconiosis producing dusts than are coal miners. They are also exposed to a number of carcinogens, including asbestos, arsenic, uranium, and beryllium. Because workers in metal and non-metal mines may be particularly susceptible to malignant and non-malignant respiratory diseases, we believe serious consideration should be given to providing them with an opportunity for periodic medical examinations similar to those currently provided coal miners.

In conducting field investigations we have become involved with health problems in metal and non-metal mines. When we respond to a request for a health hazard evaluation of a smelter or conduct industry-wide studies involving metal fumes, we do not presently have right-of-entry authority to investigate the associated mining and milling operations, although the entire workplace may be owned by one company, organized by one union, and contain employees exposed to the same substances. In these situations, we have attempted to work cooperatively with the other agencies involved, since the health problems of the workers supersede the jurisdictional boundaries.

COMPLETE OCCUPATIONAL HEALTH STANDARDS

Health research conducted by the Bureau of Mines has been directed primarily toward respirable dust suppression and control, radiation, noise, and noxious gases. Health standards for metal and non-metal mines promulgated by the Department of the Interior include standards for asbestos, radiation, and noise. In addition, the Bureau of Mines has adopted by regulation the threshold limit values for more than 500

toxic substances developed by the American Conference of Governmental Industrial Hygienists (ACGIH) in 1972. Enforcement of these threshold limit values is difficult since only about one-fourth of the substances are found in metal and non-metal mines and since the levels are not accompanied by reliable methods for environmental and biologic sampling and analysis, medical monitoring, work practices and recordkeeping requirements we feel are necessary for complete occupational health standards.

We believe mine operators would find it helpful to have a standardized plan to assure that their health-related responsibilities are fulfilled. If NIOSH were to develop recommended standards for metal and non-metal mines we would first develop a list of potentially harmful chemical substances and physical agents found in mines. We would then establish priorities for standards development based on estimates of numbers of workers exposed, the severity of their exposure and an evaluation of the toxicity or carcinogenicity of the substance. In many cases, we would consider grouping health hazards found in a certain type of mine. We could then issue one document for all relevant health hazards likely to be found in that class of mining operation. Information on some hazards, such as noise, silica, extremes of temperature, and (in the West) radon daughters would be applicable to most mining operations. Other exposures would be specific to one type of mining. We believe it would be most useful to mine operators to take into account the full range of potential exposures in furnishing their workers with a place of employment free from recognized hazards.

NIOSH currently requires approximately 40 weeks to develop a criteria document and transmits about 24 such documents a year to the Department of Labor under the Occupational Safety and Health Act. Since NIOSH has not previously been given specific statutory authority for the development of recommended health standards for metal and non-metal mines, the initial criteria development process would probably be longer than 40 weeks. After a priority list is established NIOSH could develop a schedule for criteria document development.

RELATIONSHIP BETWEEN HEALTH AND SAFETY

In separating mine health research from mine safety research, it is important not to overlook those aspects of human behavioral research that have important implications for job safety. The Institute has been conducting limited research in the area of human behavioral factors affecting job safety. The recently established safety initiative within NIOSH has brought these and other safety research projects into a single organizational entity. Human behavioral factors which we are seeking to link to job safety are effects of shift work, bio-mechanical factors, and the role of the first line supervisor. Other research has already established that job stress is a hazard that can make workers ill, less productive, and more accident prone. Since safety is such an important factor in mining, we feel that the miner would benefit from the results of these and related studies.

COOPERATIVE RESEARCH

NIOSH has a Memorandum of Understanding with MESA that provides an umbrella under which the two agencies coordinate a number of research

projects. Among these projects are three related studies on the health effects of exposure to diesel engine exhaust.

One study involves the examination of over 5,000 workers in metal and non-metal mines to determine whether there are biological effects associated with underground exposure to silica and diesel emissions. MESA is collecting environmental samples for this study. This is an important area because of the long-standing problem from silica exposure and the increasing use of diesel engines underground. The second study is evaluating the use of diesel powered engines in underground coal mines to determine if there are any additional biological effects on the respiratory system of miners who are simultaneously exposed both to coal mine dust and diesel emissions.

A third study is comparing the death rates among workers in metal mines who were exposed to diesel-powered equipment with those who worked only with electric-powered equipment. Presently there are fewer than 25 coal mines in the United States that use diesel-powered equipment and only about half a dozen use such equipment in the face area. NIOSH has been opposed to the introduction of additional diesel-powered equipment in coal mines until the results of these and other studies provide sufficient information on health effects of diesel emissions.

Under an interagency agreement with the Environmental Protection Agency, NIOSH conducts energy research that is applicable to metal and nonmetal mines. Among the projects on occupational hazards associated with energy is a mortality and morbidity study of former oil shale workers to evaluate the health problems involved in shale oil

extraction. We are also developing gas and vapor monitors, a portable microwave spectrometer, and a fibrous aerosol monitor that will be useful in evaluating mine exposures as well as other workplace environments.

TRAINING AND MANPOWER DEVELOPMENT

Traditionally the training of mine inspectors and technical support personnel has emphasized injury producing hazards and all but ignored the illness producing hazards of mining. We have been working with the Department of the Interior to provide additional health training by accepting their training or inspection personnel into our regularly scheduled courses or by giving courses specifically tailored to their needs. These include courses on sampling for gases, vapors and particulates, ventilation principles and measurements, ionizing and nonionizing radiation, and noise effects and control. In addition, we provide the Mine Safety and Health Academy of the Department of the Interior with instructors, training materials, and other assistance in the development of their health training programs.

There is also a need to develop courses in universities and other educational institutions directed toward developing occupational health physicians and nurses, industrial hygienists, and safety engineers with knowledge of the health and safety hazards of mining.

Mr. Chairman, I will be pleased to answer any questions you or Members of the Subcommittee may have.