

Request for Office of Management and Budget Review and Approval for  
Federally Sponsored Data Collection

**Enhancing Dialogue and Execution of Dust Reduction Behaviors through  
Workgroup Communication**

**Section A**

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Attachment A – Federal Mine Safety & Health Act of 1977

Attachment B – 60 Day Federal Register Notice

Attachment C – Pre/Post Mine Worker Survey

Attachment D – Controls to Reduce Respirable Dust Exposure Assessment Worksheet for Workers and Management

Attachment E – Participant Focus Group Worksheet

Attachment F – Participant CPDM Safety Circle Focus Group Guide

Attachment G – Mine Recruitment and Participation Script

Attachment H – Individual Recruitment Script

Attachment I – Informed Consent Form for Workers

Attachment J – Informed Consent Form for Management

Attachment K – IRB Approval Letter

The Centers for Disease Control and Prevention (CDC) requests OMB approval of a new research project for the National Institute for Occupational Safety and Health (NIOSH) Mining Program for a three-year period.

- **Goal of the study:** Determine and assess the impact that consistent workgroup health communication has on: (1) what and how *workgroup communication practices* can encourage mineworker H&S; (2) what “*corrective actions*” workers can take to reduce their exposure to respirable coal mine dust; and (3) how those communication practices and work actions can be best *implemented and maintained* over time.
- **Intended use of the resulting data:** Provide information to mine safety and health practitioners, operators, and industry officials about ways to best implement, evaluate, and sustain communication efforts to reduce workplace risks, injuries, and illnesses, including corrective actions that can help reduce exposures to respirable coal dust.
- **Methods to be used to collect data:** Pre/post surveys with workers that take no more than 15 minutes, focus groups in the form of group safety circle meetings will occur two times and take no more than 60 minutes each – involving a mine workgroup and respective shift supervisors. This data will be collected via worksheets completed by participants and note taking that will be typed for analysis.
- **The subpopulation to be studied:** Mine workers and managers of underground coal mine operations throughout the United States.
- **How data will be analyzed:** This data will not be used for statistical analysis. Notes will be summarized and coded. Qualitative data coding will be applied during the analysis phase to ensure validity of results. The survey will be used to show frequencies and means, the sample will not be large enough to determine statistical significance, but we can still analyze trends in the data.

## A. Justification

### 1. Circumstances Making the Collection of Information Necessary

This information collection request (ICR) is a new request. This collection request describes data collection tasks under the project entitled “Analysis of Health and Safety Management System (HSMS) Practices through Multilevel Interventions.” This study is being conducted by the National Institute for Occupational Safety and Health (NIOSH). NIOSH, under P.L. 91-173 as amended by PL 95 -164 (Federal Mine Safety and Health Act of 1977, See Attachment A) has the responsibility to conduct research relating to innovative methods, techniques, and approaches dealing with occupational safety and health problems. Approval is being sought for three years.

Health and safety management systems (HSMS) offer a comprehensive framework to managing worker and workplace health and safety. Usually developed at the management level and then disseminated to lower levels, the system must be interpreted and responded to as intended to have behavioral impact [Wold and Laumann 2015]. However, the more communication that occurs and/or the more complexity of those interactions, the less likely it is that employees will hold a similar view of an organizations’ safety climate and comply with the safety system in place [Keyton 2011]. Such misunderstandings can elevate workplace risks. In response, a more integrated approach to managing health and safety is needed. One integrative approach commonly used is to solicit and encourage worker participation in identifying potential problems and developing suggestions for improvement are health/safety circle meetings among workers and site leaders [Aust and Ducki 2004].

Research suggests finding a specific topic to focus on while trying to reveal best practices in occupational health and safety. This current study focuses on a specific problem within the mining industry to assess what and how communication practices support mineworkers’ actions within their work groups to actively reduce exposure to respirable coal mine dust. Coal Workers’ Pneumoconiosis (CWP) or “Black Lung Disease” is caused by miners’ exposure to respirable coal mine dust and is the leading cause of death due to occupational illness among US coal miners. Recent data suggests that, after many years of decline in CWP, the prevalence of new cases is increasing. X-rays provided from the US National Coal Workers’ X-ray Surveillance Program show that new cases of CWP are occurring among miners who have worked exclusively under old respirable coal mine dust exposure limits.

To ensure workers’ are not consistently overexposed to respirable mine dust, a new respirable dust rule passed May 1, 2014 (CFR Part 70) that requires mine operators to use Continuous Personal Dust Monitors (CPDM) by February 1, 2016, for designated occupations (DO). Although CPDMs provide miners with near real-time dust data about their level of respirable coal dust exposure, they do not ensure that miners will decipher and use the data provided on their CPDM to reduce dust. It is important for miners to not only understand how they can use the technology to monitor their exposure to respirable dust, but exactly what and how they can engage in actions to reduce exposure whether individually or as a group within their mine. Previous research indicates that the use of information technology can enhance lateral and horizontal communication within organizations, showing support for using the CPDM in the current study (e.g., Hinds and Kiesler, 1995) as a tool to facilitate communication around factors that contribute to elevated dust. Therefore, this project is using the Continuous Personal Dust Monitors (CPDM), as an informational and educational medium to help workgroups communicate about and manage their health outcomes.

Safety circles are used to communicate and encourage specific behavior changes. A typical circle includes a facilitator or leader (who directs the meetings), 7-10 members, and meetings that take place during the

workday. During meetings members review information relevant to the problem and brainstorm possible solutions. Industries have successfully used “safety circles” to generate lists of safety concerns that should be further assessed and solved. For example, Edwards [1983] documented that one surface coal mine was able to decrease the number of accidents on circle members’ shifts by 27%. If underground coal miners are able to actively participate in discussions about respirable coal dust exposures and what can be done to limit future exposure, they may be more inclined to behave in ways that limit their exposure. Furthermore, underground coal miners are probably the most qualified people to discuss causes for variations in respirable coal mine dust exposure, and possible ways to decrease exposure, because they are familiar their work activities and conditions.

## **2. Purpose and Use of Information Collection**

Organizational communication within workgroups about specific health issues has not been assessed in mining; it is important for NIOSH to collect this information. Because mining is a hazardous and dynamic environment, clear, supportive communication practices and processes are extremely important to maintain the health of workers. The information will be used by NIOSH researchers to determine first, the most desired communication practices to support worker health and safety and second, possible corrective actions that can be taken by workers to facilitate and reduce exposure to respirable coal mine dust. Based on the May 2014 regulation, mine operators must provide workers with “corrective actions” if they are overexposed to coal dust, per the data on their CPDM. Results from this effort will inform such behavioral responses that can be implemented by the worker. If we do not collect this information, the industry will have a much longer learning curve to discover the best, most useful ways to communicate about and use the CPDM dust data to both improve the health of its employees and comply with the new regulations set out in CFR Part 70.

The information collection will be used during the three-year approval period to analyze and report results to answer the questions posed for this study and when a stakeholder requests data being collected. Besides disseminating tailored results and considerations to the participating mine sites, NIOSH will distribute results via trade journal outlets, peer-review outlets, and conference presentations to reach stakeholders.

This project and data collection has already been fully funded by the NIOSH Office of Mine Safety and Health Research.

## **3. Use of Improved Information Technology and Burden Reduction**

The information collected via data collection instruments will require respondents to answer questions during a focus group and complete a worksheet and paper-pencil survey. NIOSH wants to comply with the Government Paperwork Elimination Act, Public Law 105-277, title XVII, signed into law on October 21, 1998. However, due to the limited internet access at remote coal mines, electronic responses have been perceived as less convenient by several mine operators. Therefore, the paper-pencil options for this specific commodity are more desirable.

Another portion of this data collection involves the use of automated, electronic, mechanical or other technological collection techniques or other forms of information technology. Electronic data collection procedures are being used as this is the only feasible method to know what the approximate dust data exposures are among this population. However, this information is not being stored. Rather, dust exposure data from workers’ CPDMs are only being used by the workers who participate as a reference point during the focus group meetings that occur throughout the study. Therefore, NIOSH will not be documenting or storing any dust data exposure information.

#### **4. Efforts to Identify Duplication and Use of Similar Information**

A thorough literature review was conducted to identify potential similar information. This literature search involved the following databases: Google Scholar, J-Stor, and ISI Web of Knowledge. Further, the researchers have attended conferences to determine that this information has not yet been collected in the mining industry. Also, the primary investigator and colleagues met with the Respiratory team at the Morgantown office of NIOSH which has conducted numerous studies on Black Lung Disease, and members of the Dust team at the Pittsburgh office of NIOSH which has conducted numerous dust control studies to ensure that they were also not aware of any studies assessing the utilization of CPDM dust data cards to help identify and minimize respirable dust exposure in underground mining. Subsequently, the researchers concluded that numerous studies have been published and conducted about how miners perceive CPDMs, and the affect respirable dust has on miners' long-term health. There are, however, no known studies that focus on miners' group communication efforts and subsequent behaviors to reduce their exposure to respirable dust as a result of discussing methods that work and do not work to make their surrounding environment safer for their personal health.

In addition, the literature review, or gap analysis also revealed that specific data related to the use of engineering control technologies to bridge communication between various levels within an organization – to help improve worker behavior, does not exist. Numerous engineering publications detail how the CPDM helps comply with health and safety regulations. However, research that focuses on user integration and behavior is absent in the mining literature. Therefore, NIOSH will be taking several areas absent in current literature and addressing these gaps on multiple levels within mine organizations with a main focus on improving communication processes around worker health.

#### **5. Impact on Small Businesses or Other Small Entities**

No small business will be involved in this data collection.

#### **6. Consequences of Collecting the Information Less Frequently**

NIOSH's social science researchers are the only individuals in the United States specifically dedicated to the development, testing, and utilization of instruments that can be used to provide specific, tailored safety/health recommendations to the industry. If NIOSH does not conduct the subject research, it is doubtful the mining industry, academia, or enforcement agencies will conduct such an extensive study to assess the communication practices and processes within mine workgroups to support and encourage health behavioral decisions. Particularly, as the mining industry continues to experiment with new technology, hire new workers, and engage in health and safety management implementation, it is critical that research be conducted to assess what type of communication processes influence and support these individual health decisions. If this research is not conducted, assessments and subsequent recommendations about how to alter a mine organization's communication practices that supports health/safety will not be disseminated to industry personnel.

The data collection request for the study is for two to three responses from participants over a six-week period. Data needs to be collected throughout the duration of the study to evaluate the effectiveness of the safety circle meetings on miners' changes in health/safety corrective behaviors and peer communication frequency and quality with each other on the job. Without collecting this data more than once, there will be no way to assess a change in participants' behaviors and perceptions as well as identify corrective actions that helped to potentially reduce exposure to respirable dust, per worker feedback during the meetings. To our knowledge there are no legal obstacles to the collection as planned.

## **7. Special Circumstances Relating to the Guidelines of 5 CFR 1320.5**

This request fully complies with the regulation 5 CFR 1320.5.

## **8. Comments in Response to the Federal Register Notice and Efforts to Consult Outside the Agency**

A. A 60-day Federal Register notice was published in the Federal Register on January 23, 2015, Vol. 80, No. 115 , pp 3598-3600. (Attachment B). No comments have been received on this FRN.

B. A health and safety manager of a mining company was contacted to obtain feedback about the feasibility of the proposed project within coal organizations. This individual also reviewed the data collection materials for content accuracy and target audience (i.e. mineworker) readability:

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Safety Manager  
Appalachian Mine Services  
54912 Pond Fork Road  
Wharton, WV 25208  
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Fax: (304) 247-1737

He provided feedback that encouraged us to cut the original study design from 12 weeks to 6 weeks, with two visits being doable. He also provided feedback about the questions we intended to ask the workers, indicating that talking about the actual CPDM dust data readings would be quite useful for this audience, because they learn via group and one-on-one discussions.

## **9. Explanation of Any Payment or Gift to Respondents**

Respondents will not receive any form of payment or gifts.

## **10. Assurance of Confidentiality Provided to Respondents**

This submission has been reviewed by the CIO who determined that the Privacy Act does not apply to this data collection, since no information in identifiable form (IIF) is being collected.

During the informed consent process, participants will not provide any form of identifying information (e.g., name or SSN); therefore no IIF will be included in the data records. Participants are not promised total and absolute privacy. However, they are told that all of the data will be private and be treated in a secure manner.

During the informed consent process, participants are assigned a number which will not be linked with a name or other identifying information. This number is only used for data organization purposes for the researchers when writing and subsequently typing notes from the safety circle meetings. All information provided by respondents will be maintained by CDC/NIOSH/OMSHR researchers in a secure manner unless compelled otherwise by law. The data files will be analyzed in the aggregate and no individual respondents will be identified.

## Overview of the Data Collection System

OMSHR researchers developed a pre/post study design that utilizes CPDM dust data as an informational medium, and focus groups with workers and site leadership. Mine workers and site leaders who work in underground coal mines will be recruited through mine management to participate in the study. Our research team has extensive contacts with a variety of coal mine organizations in the United States. We will utilize our contacts to inquire with mine management about first, their willingness to participate as a mining organization and subsequently, the potential willingness of their workers to participate. It is estimated that anywhere from one to three mines per year may be contacted to participate, for an estimated sample of no less than three but no more than five participating mines over a three-year period.

If mine management agrees to offer the option to participate as an organization (both leadership and worker), NIOSH researchers will travel to the mine site and introduce the study to potential participants. The potential participants will be read a recruitment script (Attachment G/H). Finally, if interested in participating, researchers will read and provide respondents participating (i.e., completing surveys, answering questions during focus groups and completing respective worksheets) a documented informed consent form (see Attachment I/H) before data collection begins. Management and workers will be given the option of consenting or declining individual participation. Those who decline participation can simply leave the room. The informed consent documents contain the principal investigator's contact information, research point of contact information, and the NIOSH HSRB/IRB contact information.

A hard copy of the survey will be provided to individual miners on a clipboard that they can complete via pen/pencil. Researchers may read the survey to miners if they want to participate but do not want to read the survey. Then, the researcher will fill in the answers for the participant as requested. Researchers will collect all survey forms from participants when they are finished. The other data collection consists of researchers asking participating questions and recording their answers via note taking as well as workers completing worksheets during the safety circle discussions that deal with changes in personal actions to identify and reduce dust exposure. Conversations will not be audio-recorded.

It is expected that the miners of the participating mines will vary along a number of variables including age, gender, job role, and experience. The number of employees selected for participation at each mine will vary, depending on the size of the mine, time allotted for the mine trip, and workers' willingness to participate. An inclusion criterion for participants is that they must be a mine worker/employee. There are no exclusion criteria.

The number of individual mine workers who participate in the study will not exceed 80. The number of individual leaders who participate in the study will not exceed 10. Therefore, the total sample for these series of CPDM safety circle studies will not exceed 90 over a three-year period. We will conduct the research above ground at the mine, on company time during employees' shifts.

Upon arrival on NIOSH's site, data will be summarized and as appropriate by method, entered into computer software applications (i.e. SPSS, Word, Excel) by NIOSH researchers and will be stored on a password-protected NIOSH computer. Hard copy data forms will be kept in a locked cabinet in the PI's locked office at the secure NIOSH Pittsburgh site until all data has been summarized, analyzed and verified (approximately three years from initial data collection). Prior to the finalization of the report all individual subject data will be destroyed. It is estimated the data will be on file for the life of the project and then destroyed. No personal identifiers will be collected that can link an individual. The data can be analyzed by NIOSH researchers so no outside personnel will have access to the data.

## IRB



This data collection has been reviewed by the NIOSH Human Subjects Review Board (HSRB) and received approval April 23, 2015. A copy of the approval letter is provided in Attachment K.

**10.1 Privacy Impact Assessment Information**

No individually identifiable information will be collected or retained by NIOSH.

**11. Justification for Sensitive Questions**

Respondents will not be asked questions of a sensitive nature.

**12. Estimates of Annualized Burden Hours and Costs**

A. The respondents targeted for this study include rank-and-file miners as well as mine safety and health managers. A sample of 90 individuals (up to 80 workers and up to 10 managers) will be collected from various mining operations who have agreed to participate. It is estimated that it will take about 5 minutes to recruit a particular mine via email or phone and 5 minutes to consent the individual workers and managers once on site. The amount of time to complete a data collection instrument each visit will vary from about 15 minutes to one hour, depending on the method. Data collection will be done with various instruments during each visit throughout the study. In general, data will be collected two times from participating mine workers and two times from participating mine management while feedback will simply be provided back to management in the middle of the study and at the end of the study. In order to reduce burden to the respondents only a small sample will participate at each participating mine. This will reduce the total burden hour.

The following table provides an estimate of the annualized burden hours. The estimates are based on the researcher’s previous experience conducting similar methods of data collection.

Estimated Annualized Burden Hours

Type of Respondent	Form Name	No. of Respondents	No. Responses per Respondent	Average Burden per Response (in hours)	Total Burden Hours
Mine & Health Safety Managers/Leaders	Mine Site Recruitment and Participation Script	2	1	5/60	1
	CPDM Safety Circle Meeting	3	2	30/60	6
	Controls to Reduce Respirable Dust Exposure Assessment Worksheet for Workers and Management	3	1	15/60	1
Individual Mine Workers	Mine Worker Recruitment Script	27	1	5/60	2
	Pre/Post Mine	27	2	15/60	14

	Worker Survey				
	CPDM Safety Circle Meeting	27	2	30/60	27
	Controls to Reduce Respirable Dust Exposure Assessment Worksheet for Workers and Management	27	1	15/60	7
	Mine Worker Focus Group Worksheet	27	2	15/60	14
<b>Total</b>					<b>74</b>

B. The estimated total cost for this information collection is \$5,562.96.

**Estimated Annualized Burden Costs**

Type of Respondent	Total Burden Hours	Hourly Wage Rate	Total Respondent Costs
Individual Mine Workers	66	\$24.44	\$1613.04
Mine & Health Safety Managers/Leaders	8	\$30.16	\$241.28
			\$1854.32

The value assigned for the hourly wage rate is based on the average U.S. hourly wage rate for miners available in the following information: Bureau of Labor Statistics, U.S. Department of Labor, *May 2013 National Industry-Specific Occupational Employment and Wage Estimates NAICS 212000 - Mining (except Oil and Gas)*, on the Internet at [http://www.bls.gov/oes/current/naics3\\_212000.htm#00-0000](http://www.bls.gov/oes/current/naics3_212000.htm#00-0000) (visited October 21, 2014).

**13. Estimates of Other Total Annual Cost Burden to Respondents or Record Keepers**

None.

**14. Annualized Cost to the Government**

Data will be collected for three years. The estimated annual cost to the Federal Government is \$58,251.30. This includes data collection by CDC/NIOSH employees, data analysis, and report writing. The hours designated for government staff were calculated as shown in the table below. The total cost average for a three year period is \$174,753.90.

	Hours	Hourly Rate	Cost at Hourly Rate	Other Costs (data collection, etc.)	Total
Personnel 2 GS-12-3	780	\$36.21	\$28,243.80	\$7,500	\$35,743.80

Personnel 3 GS-12-1	300	\$33.94	\$10,182	\$2,500	\$12,682
Personnel 4 GS-14-1	50	\$47.70	\$2,385	\$500	\$2,885
Personnel 1 GS-9-1	50	\$23.41	\$1,170.50	\$N/A	\$1,170.50
Total					\$52,481.30

## 15. Explanation for Program Changes or Adjustments

This is a new data collection.

## 16. Plans for Tabulation and Publication and Project Time Schedule

Data analyses will be conducted over the life of the project. Results from this project will contain trends and patterns, as revealed from the longitudinal qualitative data analysis, about changes in workers' perceptions of dust-related diseases and other health outcomes, and communicative actions that support healthier work practices that reduce exposure to respirable dust. For example, any changes observed from the first to second visits at each site can document changes that workers made to their own behavior, based on feedback they were receiving from the CPDM and how those changes reduced exposure, based on continuous monitoring of their exposure using the technology, and if they intend to sustain these behavior changes. Documenting these "corrective actions" or "meaningful changes" and relaying them back to the coal industry will be useful information as mine sites work to comply with the new, reduced dust regulation of 1.5 mg/m<sup>3</sup> in the near future. Also, documenting the types of communication practices that workers desire from their supervisors and coworkers to make healthier decisions on the job will be pragmatic information for the industry. For example, if workers' knowledge of their exposure increases based on workgroup discussions around their dust data cards, as proposed in the current study, we can encourage other mines to use these dust data cards as a knowledge-building activity rather than one for compliance. These results will primarily be disseminated throughout industry or "trade" outputs so we have direct impact on the mining industry.

The project schedule below provides an estimate of data collection activities, analysis, and dissemination. We are estimating no more than five mines to participate throughout the three-year period. This is our best estimate at this time.

### Project Time Schedule

Activity	Time Schedule
CPDM Safety Circle Study at Mine 1	2 months after OMB approval
Mine 1 Analysis & Feedback	4 months after OMB approval
CPDM Safety Circle Study at Mine 2	8 months after OMB approval
Mine 2 Analysis & Feedback	10 months after OMB approval
CPDM Safety Circle Study at Mine 3	14 months after OMB approval
Mine 3 Analysis & Feedback	16 months after OMB approval
CPDM Safety Circle Study at Mine 4	22 months after OMB approval
Mine 4 Analysis & Feedback	24 months after OMB approval
Cumulative Analysis	28 months after OMB approval

Publication	30-36 months after OMB approval
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## **17. Reason(s) Display of OMB Expiration Date is Inappropriate**

Not applicable. The OMB expiration date will be displayed.

## **18. Exceptions to Certification for Paperwork Reduction Act Submissions**

There are no exceptions to the certification.

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