

**Information Collection Request for:
“MEASURING PERCEIVED SELF-ESCAPE COMPETENCIES AMONG
UNDERGROUND MINeworkERS”
Supporting Statement A**

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List of Attachments

- Attachment A – Applicable Laws and Regulations
- Attachment B – 60 Day Federal Register Notice
- Attachment C – Survey
- Attachment D – Mine Recruitment Script
- Attachment E – Participant Oral Consent Script
- Attachment F – IRB Approval

- Goal of the study: To characterize the level of perceived competence in self-escape knowledge, skills, abilities, and other attributes (KSAOs) to aid in the identification and prioritization of critical self-escape competency gaps.
- Intended use of the resulting data: The NIOSH OMSHR Mine Emergency Systems Team will utilize the results of this study as a gross baseline measure of self-escape competence among underground coal miners and provide these results to mine safety and health professionals for their consideration in preparing underground miners to successfully escape a mine emergency.
- Methods to be used to collect: Self-report survey.
- The subpopulation to be studied: a large, varied convenience sample of Underground Coal Miners in the United States.
- How data will be analyzed: Descriptive and inferential statistics will be conducted on data obtained from the survey, including (but not limited to): (M) ANOVAs, multiple regression, and mean and standard deviation reports. Statistical procedures will be used to quantify miner self-escape competence and to make inferences about relationships among aggregated miner

A. JUSTIFICATION

1. Circumstances Making the Collection of Information Necessary

Background

This is a new collection, with a two-year collection period requested. This study is being conducted by the National Institute for Occupational Safety and Health (NIOSH). NIOSH has the responsibility to conduct research relating to innovative methods, techniques, and approaches dealing with occupational safety and health problems.

After a thorough review of United States' underground coal mine emergency escape preparedness and response, the National Academy of Sciences (NRC, 2013) has emphasized the need to improve underground miner's ability to successfully escape a mine emergency. Specifically, several mine disasters of 2006 raised a number of issues about mine emergency preparedness and response particularly as they relate to self-escape competencies. As a result of the MINER Act of 2006, federal regulations now require all underground coal miners receive SCSR and escape way training quarterly throughout the year. New emergency communications and tracking systems have been mandated and installed in underground coal mines. Escape way markings and guidance was improved with the requirement that lifelines with tactile signals be installed in all underground coal mine escape ways.

While such improvements may have better prepared underground miners to self-escape, it has become increasingly apparent that further research and development of new strategies is needed to enhance miner emergency preparedness. A review of various reports on coal mine

emergency response [MSTTC 2006, U.S. GAO 2007, West Virginia Mine Safety Technology Task Force 2006, McAteer 2006a, McAteer 2006b] offered a number of recommendations for improving training that resulted in the identification of three areas of critical importance: 1) evaluation of competencies; 2) improved training methods; and 3) new training content.

The NAS report echoed these findings and offered more specific recommendations for future research. Specifically related to this ICR, the NAS recommends that NIOSH identify critical self-escape competencies as well as any existing gaps in miners' knowledge, skills, abilities and other attributes (KSAOs) to be addressed through future training research and development. The specific aim of the work proposed within this ICR is designed, in part, to respond to the specific recommendations set forth by the authors of the NAS report.

Section 501 through 513 of the Federal Mine Safety & Health Act of 1977, Public Law 91-173, as amended by Public Law 95-164, authorizes this data collection. It has been included as Attachment A.

2. Purpose and Use of the Information Collection

These research findings are expected to inform communication and training strategies designed to enhance the ability of miners to escape from underground coal mines in the event of a fire, explosion, collapse of the mine structure, or flooding of the area by toxic gas or water. Note that it is not about rescuing the miners, it is about enhancing the ability of the miners to self-escape from the mine.

To do so, miners need to perform a set of tasks that apply specific knowledge and skills in moving through the mine, avoiding dangers, and using protective equipment. In some cases, using the protective equipment will prevent a miner from doing some tasks, and the miners need knowledge and skills to work around these limitations. The physical and mental requirements for successful self-escape need to be specified and compared with actual miner capabilities, and recommendations made on improving the likelihood of successful self-escape through the redesign of tasks and technologies to match miner capabilities under various disaster scenarios. This IC will contribute to our understanding of actual miner capabilities from the perspective of the mineworkers themselves.

Data collection will occur above ground and a variety of coal mines and other above ground facilities to gather information from a diverse convenience sample of mines to better reflect the variability (e.g., size, mining method, geographic location) that exists among mines that may impact self-escape procedures and resource availability (e.g., policies, tools, technology). Variability in mining sites is key to broad application of the results.

This data collection will occur once for each minesite over the next 2 years (after OMB approval) and is designed to gather information not previously available. These data collection instruments are not being used in any other research. The results we produce are expected to lead to recommendations for emphasis in existing KSAO training and preparation as well as to inform future self-escape training and research development.

This data will be used by the Centers for Disease Control and Prevention (CDC), the National Institute for Occupational Safety and Health (NIOSH), and the Office of Mining Safety and Health Research (OMSHR) to improve miner self-escape. This research has been fully funded.

3. Use of Improved Information Technology and Burden Reduction

This information collection will not use automated, electronic, mechanical, or other technological collection techniques or other forms of information technology. Participants will be completing surveys at their worksites during the course of their normal workday. It is highly unusual for underground coal miners to have access to the information technology required for such information collection while working and remote locations of many minesites limit cellular access. This request does not require special information collection procedures and only the minimum amount of data/information will be collected. Due to these reasons, the researchers have determined that electronic information submission is not practicable under the conditions of this information collection request.

4. Efforts to Identify Duplication and Use of Similar Information

There are no similar data available that meet the needs for this research, as identified by the National Academy of Sciences (NAS) in the report entitled *Improving Self Escape from Underground Coal Mines*. While NIOSH has collected a small subset (9 questions) of this information from 60 miners through previous research (OMB No. 0920-0975, Exp. Date 7/31/2016), a larger sample of responses covering these items in addition to a wider range of KSAOs is required for broader application of the results for developing training strategies.

5. Impact on Small Businesses or Other Small Entities

Data will be gathered at a variety of small, medium, and large mining companies. Efforts will be made to offer a flexible data collection schedule to accommodate miners from all mines to minimize work interruption.

It is important to gather data from both large and small mines to better reflect the variability that exists among mines and any potential relationship to self-escape competency. While governmental requirements/standards exist for the entire industry, it is important to identify potential relationships among mine characteristics and miner competence.

6. Consequences of Collecting the Information Less Frequently

This is a one-time data collection effort. 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 21, 2016, vol.81, No.13, pp 3423-24 (see Attachment B). There were no public comments.

B. The researchers have consulted with experts within and outside the CDC during 2015 and the information we are gathering is not available from other sources.

This work is in direct response to recommendations for NIOSH to “review current training and identify existing gaps (in KSAOs) within the mining industry” made by the National Research Council, National Academy of Sciences (2013) in its report, “Improving Self-Escape from Underground Coal Mines”, and NIOSH will be consulting with the Mine Safety and Health Administration (MSHA), and other subject matter experts (e.g., Mining Technology and Training Center (MTTC), universities, etc.) throughout the course of the project.

9. Explanation of Any Payment or Gift to Respondents

There will be no payment from the researchers or the government for participation. We hope that mine operators allow miners to complete the survey during their scheduled shifts.

10. Protection of the Privacy and Confidentiality of Information Provided by Respondents

This submission has been reviewed by NIOSH’s Information Collection Review Office who determined that the Privacy Act does not apply. Reasons for the determination include that respondents will not provide identifying information (e.g., name or SSN), therefore no IIF will be included in the data records. A participant code number will be used when completing information, but it will not be linked with a name or other identifying information. All information provided by respondents will be maintained by researchers in a secure manner. It will not be released to third parties, except where compelled otherwise by law. The data files will be analyzed and reported in aggregate and no individual respondents will be identified.

Data will be kept secure. Risks to privacy will be minimized by not collecting participant names (we will obtain verbal informed consent). Participating mine code numbers will be used for data analysis purposes only and will not be linked with a name or other identifying information.

All records will be securely stored and will be destroyed no later than six years after the end of the project. Data will not be released to third parties, except where compelled otherwise by law. The data files will be analyzed and reported in aggregate and no individual respondents will be identified.

Mine management and individuals will be informed during both the recruitment process and informed consent process that providing information throughout their participation is completely voluntary. They will also be informed that they may terminate their participation at any time, without fear of negative consequences. Study researchers/facilitators will verbally read and obtain informed consent from respondents. A hardcopy of this consent form will also be provided to respondents (see Attachment E) before data collection begins. In the consent script, respondents are advised that:

- Participation is voluntary

- Data will be reported in aggregate form only
- Respondents have the right to discontinue participation without penalty
- Information collected will be kept secure

No identifiable information will be collected.

11. Institutional Review Board and Justification for Sensitive Questions

IRB Approval

This data collection (NIOSH Protocol 16-PMRD-01XM) was reviewed by the NIOSH Human Subject Review Board (HSRB) and received an IRB Exemption Determination on April 5, 2016 (**Attachment F**).

Sensitive Questions

No sensitive questions will be asked during the data collection process. Mine corporations will not be asked to share any information they consider to be proprietary .

12. Estimates of Annualized Burden Hours and Costs

The annualized burden rate is presented below for this data collection.

Participants will be mining personnel drawn from multiple operating underground coal mines so that the sample includes the variety within the industry. The timing of the data collection schedule will be flexible and modified as needed to minimize disruption to mine operations. No more than 800 miner volunteers will participate in the study over two years. Minimal time (< 5 minutes each) will be spent in recruitment and obtaining informed consent. The survey is expected to take no longer than 10 minutes to complete.

The type of respondent, form name, number of respondents, average hours per data collection type, total burden hours, and total cost are presented in the following table. Average hourly wage rates were obtained from the Bureau of Labor Statistics for relevant occupation titles.

Estimated Annualized Burden Hours

| Type of Respondent | Form Name | No. of Respondents | No. Responses | Average Burden | Total Burden |
|--------------------|-----------|--------------------|---------------|----------------|--------------|
|--------------------|-----------|--------------------|---------------|----------------|--------------|

| | | | | | |
|-----------------------------|--------------------|-----|----------------|-------------------------|-------|
| | | | per Respondent | per Response (in hours) | Hours |
| Coal Mine Production Worker | Mine Worker Survey | 400 | 1 | 10/60 | 67 |
| Total | | | | | 67 |

Estimated Annualized Burden Costs

| Type of Respondent | Form Name | Total Burden Hours | Hourly Wage Rate | Total Respondent Costs |
|-----------------------------|--------------------|--------------------|------------------|------------------------|
| Coal Mine Production Worker | Mine Worker Survey | 67 | \$26.09 | \$1748.03 |
| Total | | | | \$1748.03 |

The value assigned for the hourly wage rate is based on the average U.S. hourly wage rate for mine training and development specialists and mine production workers available in the following information: Bureau of Labor Statistics, U.S. Department of Labor, *May 2014 National Industry-Specific Occupational Employment and Wage Estimates NAICS 212000 - Coal Mining*, at http://www.bls.gov/oes/current/naics4_212100.htm (visited December 31, 2015).

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

There will be no additional cost for record keeping because the respondents are not required to maintain records as a consequence of this research.

14. Annualized Cost to the Federal Government

Data will be collected for two years. The estimated annual cost to the Federal Government over those two years is \$24,854. This includes data collection by CDC/NIOSH employees, data analysis, report writing, and travel. The travel cost column displays the estimated cost to travel to mine sites for data collection. Two NIOSH employees will be working on this project. The cost for government staff to complete the work were calculated as shown in the table below. The total cost for a two year period is \$49708.

| | Hours | Hourly Rate | Cost at | Travel Costs | Total |
|--|-------|-------------|---------|--------------|-------|
|--|-------|-------------|---------|--------------|-------|

| | | | | | |
|---------------------|-----|---------|-------------|---------|----------|
| | | | Hourly Rate | | |
| Personnel 1 GS-9-1 | 300 | \$24.02 | \$7206 | \$3,000 | \$10,706 |
| Personnel 2 GS-12-3 | 300 | \$37.16 | \$11,148 | \$3,000 | \$14,148 |
| Total | | | | | \$24,854 |

15. Explanation for Program Changes or Adjustments

This is a new data collection.

16. Plans for Tabulation and Publication and Project Time Schedule

| Research Activity | Date Completed |
|--|----------------------------|
| Mine Recruitment | 18 mos. after OMB approval |
| Data Collection | 20 mos. after OMB approval |
| Data Analysis and Mine-Specific/Reporting | 24 mos. after OMB approval |
| Cumulative Analysis and Publication of Results | 36 mos. after OMB approval |

17. Reason(s) Display of OMB Expiration Date is Inappropriate

The display of the OMB expiration date is not inappropriate.

18. Exceptions to Certification for Paperwork Reduction Act Submissions

There are no exceptions to the certification.