

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

Measuring Perceived Self-Escape Competencies among Underground Coal
Mineworkers

Section B

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1. Respondent Universe and Sampling Methods

Potential Respondent Universe

The Mine Safety and Health Administration (MSHA) reported the following numbers for operating underground coal mines and employees in 2013

[<http://www.cdc.gov/niosh/mining/statistics/allmining.html>, retrieved 1/4/2016]:

- 759 active underground mining operations
- 52,264 mine operator employees in underground work locations

Subjects for this research project will be mineworkers from active underground coal mines in the United States.

Sampling Methods

This study will utilize a purposive sampling strategy to reduce bias and allow researchers to gather perspectives from a variety of mineworkers [Yin 2011]. In an effort to maximize the likelihood of recruiting a varied sample of mines for participation in the study, mines from a variety of companies and geographic location which vary in size and mining method will be targeted. NIOSH believes that this sample can be obtained based on previous data collection efforts and existing mine contacts. A description of the mines where data is collected will be provided in any publications of the data (e.g., size, location, etc.). To maximize participation and reduce burden, convenience sampling will also be used during field visits to recruit easily accessible mineworkers [Yin 2011].

Respondent Selection Methods and Anticipated Sample

It is expected that the employees of the participating mines will vary across a number of variables including age, gender, and experience. Convenience sampling will be utilized and based on the availability of mine workers at the time of the site visits. In an effort to gather the most varied data practicable, a target sample size of 800 underground coal mine workers is estimated allowing a margin of error of plus or minus 3 percent at a 95 percent level of confidence.

2. Procedures for the Collection of Information

Sampling and Recruitment Procedures

A convenience sampling approach will be used by NIOSH researchers while visiting participating mine sites. The employees that are working while the NIOSH research team is present will have the option to participate in the survey. Recruitment will take place during regularly scheduled safety meetings to reduce burden on the mine and mineworkers and to maximize participation. Attempts to minimize the inherent bias in convenience sampling and maximize potential broad interest in our results will be made throughout recruitment and the selection of mines and miners will consider the variability across mine size, geographic location, and mining method. When possible, researchers will collect data from

mineworkers covering all shifts. Irrespective of the limitations of convenience sampling, the benefits of using this sampling technique outweigh the risks in terms of accessibility to mine sites and mineworkers.

The survey will be introduced to the group(s) and administered by key personnel on the project (NIOSH researchers trained in survey administration). An oral consent script will be read to the participants before data collection begins. After researchers read the oral consent script and answer any questions, each individual has the option to voluntarily participate. Any individual who elects to participate will complete the survey. Those who decline participation can simply leave the room or not complete the survey. Participants can withdraw consent at any time without penalty. NIOSH researcher and HSRB contact information will be provided for participants to for future reference.

Data Collection and Organization

There is no time limit to complete the survey. The estimated completion time, based on time tests, is no more than 10 minutes. NIOSH researchers may read the survey to mine workers requested by the participant (e.g., if they do not have their reading glasses with them). The researcher will complete the survey for the participant based on verbal responses.

The survey instrument is close-ended and requires respondents to rate their perceptions on a 10-point Likert-type scale, ranging from 0% confident to 100% confident in their ability to correctly demonstrate or explain to a coworker 27 self-escape different competencies. This is a non-intrusive field study and no variables will be manipulated.

Upon returning to the research facility, members of the research team will enter the information from the survey into a password protected computer database using the Statistical Package for the Social Sciences (SPSS), a word processor program, and a database spreadsheet.

Statistical Analysis

Descriptive and inferential statistics of survey data will be used quantify miner self-escape competence and to identify potential relationships among aggregated miner characteristics and perceived competence. This cross-sectional data set will also be used to serve as a gross baseline measure for underground coal mineworker perceived self-escape competence for future comparison utilizing the identical instrument.

3. Methods to Maximize Response Rates and Deal with Nonresponse

In an effort to maximize response rate, surveys will be administered during regularly scheduled safety meetings or other gatherings. Prior experiences with this approach have resulted in response rates which approach 80% of available employees. The actual response rate (% of underground mineworkers employed at the mine) could be lower due to temporary absenteeism and potential shift coverage error. At the participants' convenience, efforts will be made to arrange survey administration for any/all shifts and work location to reduce under-coverage. Because inherent differences between respondents and non-respondents can lead to bias in survey results, efforts to minimize elective non-response (refusal to participate, incomplete survey forms) will include convenience sampling techniques mentioned above, the use of non-sensitive and non-intrusive survey questions and a low response workload/burden. The design

and layout of the survey has also been considered (e.g., legibility and comprehension levels required) and the survey perception questions are limited to one page. Nonresponse will be minimized through convenience sampling, adequate explanation of the purpose and value of the information collection, and other factors such as the target samples' familiarity with NIOSH's research efforts and mission based on previous experience. NIOSH also has a history of collaboration with the industry, as well as a strong record of protection of anonymity, confidentiality of responses, and provision of valuable feedback.

Tests of Procedures or Methods to be Undertaken

The survey items were generated as a result of an extensive review of the mine emergency response literature, previous gap studies and consultation with subject matter experts. Nine of the 27 self-escape competency questions were contained in a previous information collections (OMB No. 0920-0975, Exp. Date 7/31/2016) and were used to assess perceived levels of competence among miners who participated in virtual self-escape exercises. While there is a finite set of KSAOs required for successful escape from an underground mine emergency, it is possible questions could be added, deleted or replaced, based on ongoing task analysis & prioritization work. OMB will be informed of any changes to the survey procedures or data collection instrument.

4. Individuals Consulted on Statistical Aspects and Individuals Collecting and/or Analyzing Data

The persons who will collect and/or analyze the data are listed below. Should the project require further guidance on scientific issues regarding data, other internal resources are available through teams within the project staff's branch.

1Project Staff:

These are the primary individuals who are leading study design, data collection, and analysis efforts.

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