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DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention

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Agency Forms Undergoing Paperwork Reduction Act Review

The Centers for Disease Control and Prevention (CDC) publishes a list of information collection requests under review by the Office of Management and Budget (OMB) in compliance with the Paperwork Reduction Act (44 U.S.C. Chapter 35). To request a copy of these requests, call (404) 639-7570 or send an email to omb@cdc.gov. Send written comments to CDC Desk Officer, Office of Management and Budget, Washington, DC 20503 or by fax to (202) 395-5806. Written comments should be received within 30 days of this notice.

Proposed Project

Assessing and Evaluating Human Systems Integration Needs in Mining - New - National Institute for Occupational Safety and Health (NIOSH), Centers for Disease Control and Prevention (CDC).

Background and Brief Description

NIOSH, under P.L. 91-173 as amended by PL 95 -164 (Federal Mine Safety and Health Act of 1977), and PL 109-236 (Mine Improvement and New Emergency Response Act of 2006) is

requesting OMB approval for a new project for a 3-year period. The project is aimed at determining the following information with regards to the necessary inclusion of Human Systems Integration into research related to underground coal mining:

- (1) what information is critical for a miner to safely perform his job,
- (2) what processes (e.g., expertise, decision making, attention, etc.) are necessary for a miner to effectively perform his job, and
- (3) how do the miner and the machine interact.

The title has changed since publication of the 60-day Federal Register Notice (previous title "*Human Systems Integration Design Guidelines (MinerFirst) for Improved Mine Worker Safety*"). The goals of the project remain the same but several changes have been made to the research questions and plan. Several of the research questions have been updated from the initial submission to reflect a more specific focus on identifying situational information and the cognitive demands that affect a miner's ability to do his or her job. To be consistent with changes to the research questions, the data collection instruments, both the number of instruments initially proposed as well the content of the instruments has changed. Phase I and III of the research project remain unchanged, phase II however has been modified. Instead of administering one (1) research questionnaire to assess situational awareness or more specifically what information miners believe is necessary for

them to understand and interact with their surroundings and to safely complete their jobs, we have developed five (5) research questionnaires to accomplish this goal. These research questionnaires are a General Preference Questionnaire, a Subject Matter Expert Questionnaire, a Roof Bolter Operator Questionnaire, a Cognitive Lighting Questionnaire, and a Safety Director Questionnaire. Focus groups are still planned; however, this data collection method will be used to perform usability testing on any interfaces designed by the Cognitive Engineering Team. The Fatigue risk Management Systems Assessment Tool was removed; Vest Usability Testing will be performed in order to determine the usability and wearability of mining vests. During Vest Usability Testing miners are asked to first complete a Vest Usability questionnaire, wear a mining vest for one month while performing their job, and then complete a follow up Vest Usability questionnaire. Finally, a Roof Bolter Questionnaire was added to the research plan to assess and determine the usability and effectiveness of a lighting warning system during operation of the roof bolting machine. Findings from these studies will be used to obtain the type and flow of information miners need to safely perform their jobs as well as test some possible interventions to improve situational awareness in this dynamic environment.

The General Preference Questionnaire was designed to determine how and when miners working in an underground coal mine prefer to have information about their work environment, the location of themselves, others, and equipment communicated to them while they are working. This questionnaire will be administered to 75 miners working in an underground coal mine.

The Subject Matter Expert (SME) Questionnaire was designed to determine how subject matter experts (e.g., experienced continuous miner operators) prefer to have information about their work environment, the location of themselves, others and equipment communicated to them while they are working. The questionnaire will be administered to 50 miners working in an underground coal mine in one of two positions: continuous miner operator or fire boss.

The Safety Director Questionnaire was designed to determine what machinery and equipment is currently being used within the underground coal mining environment. This questionnaire will be administered to up to 50 Safety Directors working at an underground mining operation.

Vest Usability Testing was designed to examine the effectiveness and viability of physically integrating equipment. This will be done by asking a group of miners to wear mining vests during their normal work hours and complete a questionnaire before and after the vest wearing period.

Approximately 60 underground coal miners will be asked to take part in Vest Usability Testing.

The Roof Bolter Questionnaire will be used to assess the functional lighting needs and problems around roof bolting machines and the usability of a lighting feedback system for specific controls. Approximately 30 Roof Bolter Operators will be asked to complete the Roof Bolter Questionnaire (half before the intervention and half after).

There are no costs to the miners as study participation will take place during their normal working hours. Thus, any cost associated with the experiment will be incurred by the mining company. The total estimated annual burden hours are 442.

Estimated Annualized Burden Hours

Type of Respondent	Form Name	No. of Respondents	No. Responses per Respondent	Average Burden per Response (in hours)
Mine Employee	Informed Consent	285	1	5/60
Mine Employee	Talent Waiver	285	1	2/60
Mine Employee	Demographic Questionnaire	285	1	2/60
Mine Employee	Task and Cognitive Task Analyses: Continuous Miner Operator	10	1	2

Mine Employee	Task and Cognitive Task Analyses: Fire Boss	10	1	2
Mine Employee	Direct Observation: Continuous Miner Operator	10	1	4
Mine Employee	Direct Observation: Fire Boss	10	1	4
Mine Employee	General Preference Questionnaire	75	1	30/60
Mine Employee	Subject Matter Expert Questionnaire	50	1	1
Mine Employee	Safety Director Questionnaire	50	1	30/60
Mine Employee	Roof Bolter Questionnaire	30	2	15/60
Mine Employee	Vest Usability Testing	60	2	45/60
Mine Employee	Focus Groups	30	1	1
Mine Employee	Lab Experiments	30	1	1

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