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

[30Day-14-0975]

Agency Forms Undergoing Paperwork Reduction Act Review

The Centers for Disease Control and Prevention (CDC) has submitted the following information collection request to the Office of Management and Budget (OMB) for review and approval in accordance with the Paperwork Reduction Act of 1995. The notice for the proposed information collection is published to obtain comments from the public and affected agencies.

Written comments and suggestions from the public and affected agencies concerning the proposed collection of information are encouraged. Your comments should address any of the following: (a) Evaluate whether the proposed collection of information is necessary for the proper performance of the functions of the agency, including whether the information will have practical utility; (b) Evaluate the accuracy of the agencies estimate of the burden of the proposed collection of information, including the validity of the methodology and assumptions used; (c) Enhance the quality, utility, and clarity of the information to be collected; (d) Minimize the burden of

the collection of information on those who are to respond, including through the use of appropriate automated, electronic, mechanical, or other technological collection techniques or other forms of information technology, e.g., permitting electronic submission of responses; and (e) Assess information collection costs.

To request additional information on the proposed project or to obtain a copy of the information collection plan and instruments, call (404) 639-7570 or send an email to [omb@cdc.gov](mailto:omb@cdc.gov). Written comments and/or suggestions regarding the items contained in this notice should be directed to the Attention: 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**

Virtual Reality to Train and Assess Emergency Responders - Revision - 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) has the responsibility to conduct research to improve working conditions and to prevent accidents and occupational diseases in underground coal and metal/nonmetal mines in the U.S.

The turn of the 21st century started with much promise for the coal mining industry. Because there was only one underground disaster in the 1990s, it seemed that emergency response in the United States no longer needed to be a top research priority. However, major coal mine disasters between 2001 and 2010 have resulted in 65 fatalities. These events highlighted the critical need to balance investments to reduce low probability/high severity events with those that focus on frequent, but less severe injuries and illnesses.

The present research project seeks to determine optimal use of virtual reality (VR) technologies for training and assessing mine emergency responders using the Mine Rescue and Escape Training Laboratory (MRET Lab). Responders include specially trained individuals, such as mine rescue or fire brigade team members, and also managers and miners who may either be called upon to respond to an emergency situation or engage in self-

protective actions in response to an emergency. This project is a step toward determining how new immersive virtual reality technologies should be used for miner training and testing in the US.

As stated previously in the original information collection request justification, research activities involving rank-and-file underground coal miners who participate in the mine escape training may occur at either the MRET Lab or in an off-site classroom or other typical instructional setting either at an above-ground mine safety training facility, mine administration building, or a university or academic environment (hereinto referenced as the "classroom setting"). Having these two subsamples allows us to better assess uses for VR training applications, determine the potential additive value of training provided in the MRET Lab, and the potential benefits of adapting simulation-based mine emergency training to a broader audience. To accommodate an appropriate amount of mine escape participants for both the MRET Lab modules and classroom settings, we are requesting adding 60 more participants to our 150 participant data collection cap, which would ideally leave us with 30 BG4 participants, 60 mine rescue participants (MRET Lab), 60 mine escape participants (MRET Lab), and 60 mine escape participants (classroom setting), for a new grand total of 210 participants.

The project objective will be achieved through specific aims in two related areas as illustrated below.

#### Training assessment

1. Evaluate four training modules
2. Evaluate participant reactions
3. Develop guidelines

#### Training development

4. Use 3D technologies to develop a prototype for a mine rescue closed-circuit breathing apparatus (e.g., Dräger BG4).

To accomplish these goals over the life of the project, researchers will utilize a variety of data collection strategies, including self-report pre-and post-test instruments for assessing trainee reaction and measuring learning. Data collection will take place with approximately 210 underground coal miners over three years. The respondents targeted for this study include rank-and-file miners, mine rescue team members, and mine safety and health professionals. All participants will be between the ages of 18 and 65, currently employed, and living in the United States. Findings will be used to improve the safety and health of underground coal miners by assessing the efficacy of immersive VR environments for teaching critical mine safety and health skills.

To assess learning as a result of training, each participant will complete a pre-training questionnaire, a post-simulation questionnaire, and a post-training questionnaire. Participants evaluating the closed-circuit breathing apparatus training will only complete a version of the pre-training questionnaire. There is no cost to respondents other than their time. The total estimated burden hours are 47.

Estimated Annualized Burden Hours

Type of Respondent	Form Name	No. of Respondents	No. Responses per Respondent	Average Burden per Response (in hours)
Dräger BG4 participants (i.e., closed circuit breathing apparatus training participants)	Pre-Training Questionnaire	30	1	3/60
Mine Rescue participants	Pre-Training Questionnaire	60	1	3/60
	Post-Simulation Questionnaire	60	1	3/60
	Post-Training Questionnaire	60	1	3/60
Mine Escape participants	Pre-Training Questionnaire	120	1	3/60
	Post-Simulation Questionnaire (MRET Lab version)	60	1	3/60
	Post-Simulation Questionnaire (Field Test Version)	60	1	3/60

	Post-Training Questionnaire	120	1	3/60
Mine Escape/Longwall Mining participants	Pre/Post-Training Knowledge Test	60	1	6/60
Mine Escape/Continuous Mining participants	Pre/Post-Training Knowledge Test	60	1	6/60
Mine Rescue/Longwall Mining participants	Pre/Post-Training Knowledge Test	30	1	6/60
Mine Rescue/Continuous Mining participants	Pre/Post-Training Knowledge Test	30	1	6/60

Leroy Richardson  
Chief, Information Collection Review Office  
Office of Scientific Integrity  
Office of the Associate Director for Science  
Office of the Director  
Centers for Disease Control and Prevention

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