

ISRP 1999 abstract

Presenter/author	Title	Abstract
<p>Caretti, David M. Scott, W. H. Johnson, A. T.</p> <p><i>U.S. Army Edgewood Chemical & Biological Center 5183 Blackhawk Rd. APG, MD 21010- 5424 USA</i></p>	<p>Respirator Design and Communications Effectiveness: How Important is a Speech Transmission Device</p>	<p>Verbal communication between individuals wearing respiratory protective devices (RPSs) can be an arduous task due to the fact that RPSs can muffle or distort speech. Without effective speech communication between co-workers, the quality of work may be reduced and worker safety may be comprised. Thus, it is common for respirator designs to include some type of device to enhance transmission of speech. However, not all full-facepiece respirators incorporate speech transmission devices into their designs and half-mask respirators with such devices are essentially non-existent. Therefore, two studies were conducted to assess speech communications effectiveness of various RPDs both with and without speech transmission devices. One study evaluated face-to-face communication between speaker and listener pairs and one study assessed communication between subject pairs using a telephone as the communication means. The Modified Rhyme Test (MRT), an objective test designed to determine how well monosyllabic words are transmitted and understood, was used to measure speech intelligibility for both studies. During all test sessions, test administrators positioned near both the talker and listener monitored data collection. During all test sessions, test administrators positioned near both the talker and listener monitored data collection. Spoken MRT words were checked for accuracy and both voice and background noise levels were measured using a sound-level meter. Respirator conditions for face-to-face communications testing included wear of the U.S. Army M40, a concept prototype of the U.S. Military Joint Service General Purpose Mask (JSGPM), and a commercially available respirator. The M40 respirator uses a speech transmission diaphragm whereas the JSGPM and commercial respirators do not. For telephone communications testing, subjects wore the U.S. Army M17 with a speech device, five commercial respirators (two with and three without speech diaphragms), and one commercial half-mask respirator without a speech device. Mean intelligibility scores for each of the face-to-face respirator conditions were 93.9%, 82.9%, and 91.3% for the M40, JSGPM, and commercial respirator, respectively. Intelligibility scores for the telephone communication test conditions will be summarized and the implications of the results of all tests for RPD design and communications effectiveness will be discussed.</p>