

extreme position); talking (reading a standard passage, counting backward from 100, or reciting a memorized poem or song); grimacing (contracting the facial muscles); bending over (as if touching the toes); and breathing normally (remove and redon the respirator mask, then breathe normally). In addition, the authors used a short screening procedure to identify firefighters who could not pass the a complete fit testing protocol. Eighty-five (85) of the firefighters in procedure 1 (20.9%) and 30 of the firefighters in procedure 2 (28.8%) did not pass this screening test.

Comparisons among the firefighters who completed a fit testing protocol showed that the log-transformed median overall fit factor did not vary significantly between the two exercise procedures. However, after plotting the overall fit factors of the individual firefighters for the two exercises (*i.e.*, one plot for each exercise), the authors noted that the overall fit factors for procedure 1 were substantially less than the fit factors for procedure 2 at the low end of the two distributions. They interpreted this difference as indicating that the fit factors obtained using procedure 1 were more conservative (*i.e.*, lower) than the fit factors obtained for procedure 2 at lower levels of respirator fit. Based on these results, the authors concluded that the two exercise procedures resulted in similar fit factors, and that procedure 1, with three exercises and two respirator redonnings, took substantially less time to administer than procedure 2, with eight exercises (including one redonning).

Editorial and technical revisions to the Respiratory Protection Standard. In addition to proposing the CNP REDON fit testing protocol, this rulemaking is proposing to make several editorial and technical revisions to the Respiratory Protection Standard. The first editorial revision would add the proposed CNP REDON protocol to the exception already specified for the approved CNP protocol under paragraph 14(a) of Part I.A in Appendix A of the Standard. Accordingly, paragraph 14(a) would except both the approved CNP protocol and the CNP REDON protocol from the test exercises specified for the other approved fit testing protocols listed in the appendix. OSHA believes that this revision is necessary because the proposed protocol consists of a test exercise procedure that differs substantially from the procedure required for the other approved fit testing protocols.

The second editorial revision involves the introductory paragraph describing the CNP protocol under Part I.C.4 of

Appendix A. The eighth sentence in this paragraph refers to the CNP instrument manufacturer as "Dynatech Nevada." However, the instrument manufacturer now is Occupational Health Dynamics of Birmingham, Alabama. OSHA is proposing to revise this sentence to identify the current manufacturer of this instrument.

In an earlier comment to OSHA (Ex. 14), Dr. Crutchfield noted that test administrators use either an auditory warning device or the screen tracing currently provided on the CNP test instrument to detect participants' failure to hold their breath for the required 10-second period when measuring respirator fit. While using the screen tracing for this purpose was not part of the CNP protocol approved earlier by OSHA, the Agency believes that such a visual warning device would be useful in measuring respirator fit under both the approved CNP protocol and the proposed CNP REDON protocol. Therefore, OSHA is proposing to revise paragraph (c) of the approved CNP protocol (under Part I.A.4 of the standard) to include the screen tracing currently provided on the CNP test instrument as a visual warning device to detect non-compliance with the breath hold procedure.

In a 1998 journal article entitled "CNP fit testing under OSHA's updated respiratory protection standard" published in *Respiratory Protection Update*, Dr. Crutchfield indicated that OSHA's description of the CNP fit test requirements in paragraphs (a)(2) and (a)(5) of the approved CNP protocol contained several errors (Ex. 8). In this regard, the default test pressure in paragraph (a)(2) should read -15 (not -1.5) mm of water, while the breath hold requirement in paragraph (a)(5) should be 10 (not 20) seconds. Accordingly, the Agency is proposing to revise these parameters because implementing correct fit test procedures will improve the assessment of respirator fit factors using the approved CNP protocol, as well as the proposed CNP REDON protocol should the Agency approve it in a final rulemaking.

Conclusions. OSHA believes that the information submitted by Dr. Crutchfield in support of the proposed protocol meets the criteria for proposed fit testing protocols established by the Agency in Part II of Appendix A of the Respiratory Protection Standard. Therefore, the Agency concludes that the proposed protocol warrants notice-and-comment rulemaking under Section 6(b)(7) of the OSH Act, and is initiating this rulemaking to determine whether to approve the proposed protocol for inclusion in Part I of Appendix A of the

standard. However, because the only difference between the proposed protocol and the existing CNP protocol in Part I.C.4 of Appendix A is the exercise procedure used during fit testing, the Agency is limiting the proposed regulatory text (see section V below) to a description of the exercise procedure, and is referring to paragraphs (a) and (c) of Part I.C.4 for information on the CNP fit test requirements and the CNP test instrument. In addition, if approved, the protocol would be an alternative to the existing quantitative fit testing protocols already listed in the Part I of Appendix A; employers would be free to select this alternative or to continue using any of the other protocols currently listed in the appendix. The Agency also believes that the proposed editorial and technical revisions to Part I of Appendix A are necessary for proper implementation of both the approved CNP protocol and the proposed CNP REDON protocol.

Issues for public comment. OSHA invites comments and data from the public regarding the accuracy and reliability of the CNP REDON protocol, as well as its effectiveness in detecting respirator leakage and its usefulness in selecting respirators that will protect employees from airborne contaminants in the workplace. Specifically, the Agency invites public comment on the following issues:

- Were the studies described in the peer-reviewed articles well controlled, and conducted according to accepted experimental design practices and principles?
- Were the results of the studies described in the peer-reviewed articles properly, fully, and fairly presented and interpreted?
- Will the proposed protocol reliably identify respirators with unacceptable fit as effectively as the quantitative fit testing protocols already listed in Part I.C of Appendix A of the Respiratory Protection Standard?
- Will the proposed protocol generate reproducible fit testing results?
- Should OSHA expand application of the proposed protocol fit test exercises to other quantitative fit tests (*e.g.*, ambient aerosol tests)?
- Will the proposed editorial and technical revisions to Part I of Appendix A improve proper implementation of the approved CNP protocol and the proposed CNP REDON protocol?

III. References

The preamble to this proposal cites the following references:

- (1) Crutchfield C.D., E.O. Fairbank, and S.L. Greenstein. "Effect of exercise