

ISRP 2000 abstract

Presenter/author	Title	Abstract
Nelson, Thomas NIHS Inc, Ardentown, DE, USA	How Protective are Respirator Assigned Protection Factors?: an Uncertainty Analysis	<p>The assigned protection factor (APF) is operationally defined as the minimum expected workplace level of respiratory protection that would be provided by a properly functioning respirator or class of respirators, to a stated percentage of properly fitted and trained users. The percentage of users is not stated. The 5th percentile of the distribution of workplace protection factor studies has been suggested by NIOSH as being the appropriate statistic to set APFs.</p> <p>A hazard ratio is defined as the concentration in the workplace divided by the occupational exposure limit (OEL). When a respirator is selected with an APF greater than the hazard ratio, it is assumed the exposure inside the respirator will then be less than the OEL.</p> <p>For respirator use, several variables effect the person's exposure. These include the performance of the respirator and the concentration of the contaminant in the workplace. A Monte Carlo simulation of respirator use with these variables provides a way to estimate the percentage of time respirator wearers may be exposed above an OEL.</p> <p>For a half facepiece respirator with an APF of ten, used at the maximum use limit, the average percent of time a worker may be exposed above an OEL is estimated to be 0.2%. On an individual basis, a person who has a geometric mean respirator protection factor at the 5th percentile of respirator users, at the maximum use concentration of the respirator will not be exposed above the OEL for more than 7% of the time. This can be considered a worst case estimate since not all workers use respirators at the maximum use limit.</p>