

Public Use of Respiratory Protection in Nuclear Power Plant Accidents

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The Indian Point nuclear power plants, located 24 miles north of New York City, is in the nation's most populated nuclear site. Road systems are often congested and the feasibility of an effective emergency plan has been a source of contention for decades. In a post-Katrina era emergency planning questions have been raised by local citizens up through members of the US Congress and Senate. A two year study, nearing completion, on an improved emergency plan has demonstrated the significant value of respiratory protection in reducing the early fatality and early injury risks. A ten fold reduction in the inhalation dose could be accomplished just by breathing through a wet handkerchief. Face masks might offer even larger reductions. Numerical results are presented on the effects of a ten fold reduction in the inhalation dose to the early fatality and several types of early injury risks. Qualitative comparisons are made between the use of potassium iodide pills to limit the effects of inhalation of radioactive iodine and respiratory protection.

Beyond the dose reduction potential of such respiratory protection there are several other benefits. This form of public protection would be implemented by the public itself, without depending upon government agencies. This independence is expected to encourage acceptance of the improved plan. Further, preventing radioactive iodine from entering the body is preferable to limiting its effects in the body through KI pills. Slower evacuation speeds can be acceptable if face masks are worn since this would still lead to very low consequences. Face masks address many threats besides radioactive particles, increasing their appeal.