

CRITICAL EXPOSURE PATHWAYS: AN ANALYSIS OF THE ENVIRONMENTAL  
IMPACT OF GASEOUS EFFLUENTS FROM LIGHT-WATER-COOLED REACTORS

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## ABSTRACT

The analysis of the environmental impact of routine radioactive gaseous releases from operating nuclear power stations is discussed using a radiation dose assessment. This analysis includes a discussion of the origin of radionuclide effluents, a discussion of federal policies, and a calculation of radiation doses to man. A model for estimating the radioactive dose from gaseous effluents from light-water-cooled reactors is described using guidelines described in the Code of Federal Regulations and the Nuclear Regulatory Commission's Regulatory Guides. The environmental impact of these sources is then analyzed using dose rates calculated along critical exposure pathways for various radioactive nuclides.

Examples are given using reactors that have been heretofore documented in the literature. The major radionuclides in the airborne effluents from a PWR, used as an example are noble gases, H-3, radioiodines, and radioactive particles.

The results from the methodologies described in this paper are compared to federal radiation limits.

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