

Project Title: Measurement and Apportionment of Radon Source
Terms for Modeling Indoor Environments

Organization: NYU Medical Center
Department of Environmental Medicine
550 First Avenue
New York, NY 10016

DOE/ER/60547--1

DE91 000823

Principal Investigator: Naomi H. Harley

Research Objectives

This research has two main goals; (1) to quantify mechanisms for radon entry into homes of different types and to determine the fraction of indoor radon attributable to each source and (2) to model and calculate the dose (and therefore alpha particle fluence) to cells in the human and animal tracheobronchial tree that is pertinent to induction of bronchogenic carcinoma from inhaled radon daughters.

Accomplishments During 1990-1991

a. Research House Activities

a. 1. Radon Flow from Indoor/Outdoor Pressure Differences

During 1990 emphasis was placed on the analysis of variability of pressure driven flow into the ultra-high energy efficient research home in northern New Jersey. A cross-slab basement pressure sensor was installed and hourly data are collected on a portable computer with an average of about 30 pressure samplings per hour.

The regression of hourly radon and pressure data show a weak relationship but the weekly averages of hourly data indicate a reasonably good relationship (Figure 1). The regression of indoor-outdoor temperature difference with cross-slab pressure difference indicates that temperature difference is the primary mechanism (Figure 2) as is generally recognized. However, the regression is the reverse from that expected, i.e., a greater negative pressure produces dramatically decreased indoor radon. Reduced pressure inside the dwelling compared with outside brings soil radon into the dwelling, however, this generality has not yet been well supported with data to study exact mechanisms.

These data were presented at the annual Health Physics Society meeting in June 1990.

To study reasons for the overall radon variability with pressure differential we investigated whether radon in water might be a significant factor. This home has a private well and it is not unusual for ground water to be a contributor to indoor