BNV-RADON

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Radon: indoor air pollution, scary statistics

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Saving money may cause cancer! That startling statement is quite likely true if you save fuel costs by sealing your house too tightly. And yet you are being encouraged to do just that by environmental groups, government agencies, and even utilities, all of whom are trying to avoid mining more coal, importing more oil, or building more power plants.

The simple truth is that many measures taken to reduce fuel consumption also help retain pollutants in your home, fouling the air, and endangering your health. Perhaps least of the problems with indoor air pollution is radon, the naturally radioactive gas given off by most soils and building materials. Formaldehyde, from funiture and plastics, is probably more harmful, but fear of radiation pounded into us by anti-nuclear groups will likely make radon the pollutant that derails the home energy conservation movement.

Some say that since radon is a product of Mother Nature, we shouldn't worry. At first glance, the learned groups that set limits on radiation exposure seem to agree.. That is, radiation from natural sources and medical and dental X-rays doesn't count toward a person's allowable dose. So the radiation dose limits set by the National Council for Radiation Protection disregard radon and other natural radionuclides; only man-made radioactivity matters in keeping score.

But experts are concerned. After all, radon is a major source of radiation, and living tissue bombarded with radiation is damaged whether the source is natural radon or artificial plutonium. In fact, in some ways radon is worse. Its forefather, uranium-238, stays radioactive 180,000 times as long as plutonium, and it's a noble gas whose decay products get trapped deep in the lungs where they irradiate the delicate tissues. Plutonium, on the other hand, is a solid, and more easily isolated from man.

The amount of radon in your home depends on the soil on which it is built, the type of construction, and how airtight it is. The better your house is weatherstripped and sealed, the greater the radon buildup, all else being equal. Naturally, the greater the radon buildup, the greater the dose, and the greater likelihood of radon-induced cancer, since we spend 90 percent of our time indoors and there is more radon exposure indoors. And, since radon is heavier than air, it accumulates near the floor in the lowest room. Unfortunately, that is often the den, where the family gathers and children play.

The numbers are scary. More than 100,000 Americans die each year of lung cancer. According to calculations by Prof. Bernard Cohen, University of Pittsburgh, radon causes about 10,000 of these deaths. Estimates by the Environmental Protection Agency run from 6,700 to 13,400. The actual number is unknown, and, though of great concern, doesn't matter here. For, whatever the number (as long as it isn't zero), it is increased by reducing the infiltration rates of fresh air into the home.

Data used by Cohen suggest that the average home undergoes 0.75 or more air changes per hour (that is, air seeping in around the doors and windows provides a complete change of fresh air from outside every 80 minutes). But, after weatherstripping, storm doors and windows, etc., infiltration drops to about 0.3 changes per hour — an air change every 200 minutes. Radon levels, Cohen estimates, would more than double, increasing the radon-induced death rate by lung cancer from 10,000 to 20,000 per year.

The extent of the radon problem is just emerging, since only a relatively few homes have been checked. Those in New York City ranged from 160 to 2400 mrems per year to the lungs. Some homes in the Washington suburbs (Damascus, Md.) measured in 1982 were even higher, although they were tested in the winter when tightly sealed. Obviously, doses would be lower in the summer when windows are open. An interesting comparison is the yearly lung dose allowed but the Code of Federal regulations at the fence line of a nuclear power plant — 15 mrems — negligble compared with the radon in many homes.

You can see the dilemma of the anti-nuclear activists. How do you use the scare of radioactivity to shut down nuclear power plants when even Three Mile Island, the worst nuclear accident ever, only released enough radiation to give each member of the public affected an average less than 2 mrems — less than you might get in your home in several days?

And, if the activists are truly afraid of radiation, how can they dare encourage you to double your radiation burden by weatherizing your house? Are they really saying that saving a few bucks on energy costs is worth spending human lives? Are deaths given in the name of energy conservation somehow more acceptable than the far fewer deaths from nuclear power plants?

For, after all, the 1982 report of the United Nations Scientifc Committee on the Effects of Atomic Radiation states that even employess of the nuclear power industry — those most affected — receive a dose equivalent at work that is "about 0.03% of the corresponding value from natural radiation sources."

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Charles Osterberg is an employee of the Department of Energy. The views expressed here are his own.

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And Cohen reports tht even if all of our present needs for electricity were met by nuclear power, estimates of government scientists are that only 10-100 Americans would die each year — far less than from coal. Even the anti-nuclear Union of Concerned Scientists predicts only 600 deaths from nuclear power, quite insignificant compared with those from radon in the home. This poses quite a moral problem that the preconservation (and usually anti-nuclear) zealots have not yet faced.

Neither have the regulators. Morton Goldman in a speech to the American Nuclear Society pointed out that "if this were a rational regulatory world, we would expect that appropriate authorities would be driving us from our homes and back into trees (to avoid the radon)". However, there is hope. The Environmental Protection Agency has reportedly asked the Department of Energy not to propose energy conservation measures which will reduce ventilation rates below 0.5 air changes per hour in structures. That means the radon-deaths would be held to an increase of only about 50 percent rather than doubling — I guess that's progress!