

Are We Serious Enough About Radon?



Douglas Kladder
Director
Center for Environmental Research & Training
Colorado Springs, Colo.

During January's National Radon Action Month, there was a focused effort toward public awareness about radon. Given the number of news stories and television responses, I would say it was successful.

However, in listening to and participating in some of these programs, I heard a repeated message that just did not sit right. The phrase typically echoed by the news talent or reporter went something like this: "One should mitigate a home if it is above four picocuries per liter, which EPA considers to be a safe level."

Although it is correct that the U.S. Environmental Protection Agency recommends homes be fixed if they have long-term levels in excess of 4.0 pCi/L, it is totally incorrect to assume that there is no risk below 4.0 pCi/L. However, it is understandable that – with the focus on a guidance number that is found in so many publications and is part of many practices – the public could easily draw this incorrect conclusion. After all, why would a federal agency set a guidance that wasn't safe? Let's examine just how safe 4.0 pCi/L is.

Comparison of EPA Guidance to Other Contaminant Risks

Seven out of 1,000 people will contract radon-induced lung cancer at a lifetime exposure at the guidance level of 4.0 pCi/L, according to the EPA's "A Citizen's Guide to Radon." Whoa, hold the presses! Any contaminant that is regulated – whether it is for waterborne contaminants or clean-up efforts – is controlled to a maximum contaminant level exposure to where one out of 100,000 or 1 million would be affected. That means the guidance level for radon would allow for a health risk factor that is *1,000 to 10,000 times higher* than other "regulated" contaminants!

How many lives are really being saved with a 4.0 pCi/L guidance? Let's look at this from another perspective. Recent health advisories from EPA and the surgeon general indicate that approximately 20,000 lung cancer cases occur each year in the United States from exposure to radon. The assumption that many consumers make is that if homes were reduced to less than 4.0 pCi/L, those 20,000 lung cancer cases would be averted. However, that is not quite true either.

"Approximately 13,000 of the 20,000 annual radon-related lung cancer deaths occur below the action level of 4pCi/L, with about 7,000 occurring at levels above the action level 4pCi/L," said EPA press officer Roxanne Smith, in response to questions from *IE Connections*.

Whoa, hold the presses once again! What this means is that if all homes that are above 4.0 pCi/L were mitigated, only one-third of the total annual deaths would be averted. What about the other two-thirds of the cases, which amounts to 13,000 deaths per year? I would imagine that most people would not judge as successful a program that achieves its goal of reducing exposures to less than established guidelines but does not save even half of the lives at risk.

Why Such a High Risk Rate?

So, if we are serious about radon risk, why is the guidance set at such a high risk rate? In EPA's defense, setting a guidance level at a more common one-in-a-million risk would mean mitigating radon levels to less than what is found in the ambient air. This would have the effect, as one EPA staff member related to me, of condemning homes. No one wants to do that. However, in selecting a guidance number upon which many real-estate transaction contingencies are based, there is a perception that buying a home having a level below the 4.0 pCi/L guidance level would provide a safe living environment, which is

obviously

Also, "Radon" to 2 pCi/L where n health ris what ab of 3.9 pCi/L is just fir neighbor smoke a

It has use of s is assum posure, I

ugh About Radon?

Guidance t Risks

will contract
a lifetime ex-
of 4.0 pCi/L,
itizen's Guide
esses! Any con-
whether it is for
ean-up efforts
a contaminant
ut of 100,000
l. That means
would allow
is 1,000 to
r "regulated"

being saved
's look at this
ent health ad-
geon general
000 lung can-
United States
sumption that
f homes were
those 20,000
verted. How-

20,000 an-
r deaths oc-
4pCi/L, with
ls above the
press officer
to questions

again! What
at are above
one-third of
be averted.
of the cases,
s per year? I
e would not
hat achieves
less than es-
ot save even

Why Such a High Risk Rate?

So, if we are serious about radon risk, why is the guidance set at such a high risk rate? In EPA's defense, setting a guidance level at a more common one-in-a-million risk would mean mitigating radon levels to less than what is found in the ambient air. This would have the effect, as one EPA staff member related to me, of condemning homes. No one wants to do that. However, in selecting a guidance number upon which many real-estate transaction contingencies are based, there is a perception that buying a home having a level below the 4.0 pCi/L guidance level would provide a safe living environment, which is

obviously not correct.

Also, as the "Citizen's Guide" indicates, "Radon levels can be reduced in most homes to 2 pCi/L or below." At least for those cases where mitigation is employed, substantial health risk reductions are being achieved. But what about the homes that have test results of 3.9 pCi/L and the buyer thinks everything is just fine and dandy, yet their risk is in the neighborhood of one in a 100 if they do not smoke and about 10 times higher if they do?

It has also been related to me, since the use of short-term tests at the time of resale is assumed to overestimate the long-term exposure, homes are being mitigated where the

long-term exposures are less than 4.0 pCi/L and, therefore, some of the homes with moderate radon exposures are being addressed beneficially. That could very well be true, assuming the short-term tests are being conducted correctly and that they truly provide an indication of the highest radon potential of the home. However, there have been a number of studies that indicate short-term radon tests on a given home, depending upon the time of the year the home is tested, can have results varying twofold or even threefold. This certainly suggests that there can be a number of false negatives in homes where mitigation would have been prudent but did

not occur. So even with a generous 4 pCi/L guidance, the high reliance on short-term testing versus long-term testing may be causing even more of those avoidable lung cancer cases to be missed.

Several in this field have suggested that even if the short-term test result is less than 4 pCi/L, a long-term test would be highly advisable.

How Serious Are We About Radon Control Systems for New Homes?

The EPA and other organizations recommend the installation of a passive system dur-

ing the construction of a new home in high-risk areas and that, after occupation, a test be conducted. If elevated (presumably above 4 pCi/L), a fan should be installed to reduce the indoor radon levels further, according to recommendations within the appendix of the 2006 International Residential Code.

Again, a homeowner's perception of a system installed during construction is that it should prescriptively reduce levels to less than the surgeon general's recommendation of 4.0 pCi/L on a long-term basis; unfortunately, that is not the case.

Smith, the EPA press officer, indicated, "A passive system can be expected to reduce the

radon level correctly." again! If the level of, say, radon system in a system in a more than a

Compour systems at areas, where enough to w ly be above in lower zo risks are sti perception need to be c in high-risk studies stati pCi/L serio

Does Bu Prioritie

It has been est environ States with rate of 20,00 cepting this s pect that fede priority. How proposed EP see that the radon grants ministration budget. That taminant that each year an largest enviro

Granted, ra and often doe of regulated a and there are EPA and oth But on the oth consumer per with radon wh such a minisc

The purpos EPA, as the 4 many those of and a lot of p last 20 years. I es were made tions of techn

time guidance Times have have improved safer indoor e years ago. It of the approac assigning to th budget but rat Congress, and stitencies of progress has b reassess our a times and most of the uninte

high-
est be
ove 4
reduce
ling to
of the

a of a
is that
to less
ndation
unfortu-

ated, "A
duce the

radon level by about 50 percent if installed correctly." Whoa, stop those presses yet again! If the home would have had a radon level of, say, 12 pCi/L (without the passive radon system), then the installation of the system in accordance with code would reduce it to 6 pCi/L with a risk factor that is more than a risk of one in 100!

Compound this with the fact that passive systems are recommended only for Zone 1 areas, where the radon potentials are high enough to where a short-term test would likely be above 4.0 pCi/L. What about the folks in lower zone designations where significant risks are still present, yet with the unintended perception of the zone maps being that one need to be concerned only about new homes in high-risk areas? If one takes the health studies stating risks at exposures less than 4.0 pCi/L seriously, does this make sense?

Does Budget Reflect Priorities?

It has been said that radon presents the largest environmental health risk in the United States with respect to mortality, at an annual rate of 20,000 lung cancer cases per year. Accepting this staggering statistic, one would expect that federal budgets would reflect this as a priority. However, in reviewing the president's proposed EPA budget for fiscal year 2007, we see that the sum of the budget items for state radon grants and the EPA radon program administration is 0.2 percent of the entire EPA budget. That is less than 1 percent for a contaminant that causes 20,000 lung cancer cases each year and is supposed to be the single largest environmental health threat!

Granted, radon is not a regulated program and often does not get the financial priorities of regulated and compliance related programs, and there are certainly financial pressures on EPA and other branches of the government. But on the other hand, it is easy to understand consumer perception of low risk associated with radon when the radon program represents such a miniscule portion of the EPA budget.

The purpose of this column was not to bash EPA, as the 4.0 pCi/L guidance is lower than many those of other nations in the free world, and a lot of progress has been made over the last 20 years. However, many of those advances were made subject to the support or limitations of technology that were available at the time guidances and approaches were adopted.

Times have indeed changed. Technologies have improved. Consumers want and expect safer indoor environments than they did 20 years ago. It may be time to reassess some of the approaches and priorities that we are assigning to this issue. EPA does not dictate budget but rather must rely upon the will of Congress, and that takes support from the constituencies of our representatives. Certainly, progress has been made, but we also need to reassess our approaches in light of current times and most certainly as a function of some of the unintended consequences and false