

# Beginning with a Phone Call

by Michael J. Chern



Janet Luffy, EPA

“When the lady you’re speaking to breaks down crying because she’s worried that she and her family may die of lung cancer, you feel like dropping everything else and spending a month helping this one person until her problem is solved,” says Bill Belanger, EPA Region 3’s radiation expert for the last five years. Belanger is talking about his first-hand experience working directly with people who have high radon levels in their homes.

Until a year and a half ago, Belanger spent much of his time working on emergency drills for nuclear power plants. His only experience with radiation in houses was in a Lansdowne, PA, home which had been used by a university professor in the 1940s to refine radium for use in hospitals. The house is now so contaminated with radioactivity that it was evacuated under the emergency provisions of Superfund and added to the Superfund National Priorities List for remedial cleanup.

Now, with the discovery of high radon levels in the Reading Prong area of Pennsylvania, Belanger spends almost all his time on this problem.

## First Word

Belanger’s serious involvement with naturally occurring radon began on December 19, 1984, with a phone call from Charles Porter, Director of EPA’s Eastern Environmental Radiation Facility in Montgomery, AL.

Belanger remembers that the conversation began with Porter saying, “Bill, you better sit down. There’s a house in your region that has 13 working levels (WL)!” (“Working level” is one of the measures used to express radon exposure.)

Belanger replied, “Are you sure you didn’t slip the decimal a couple of places?” Until that time, everyone’s experience with natural radon had indicated that a high indoor reading was 0.1 WL; Belanger had taken readings of 0.3 WL in the Lansdowne house and had considered that extraordinarily high.

(Chern is a former Public Information Officer for EPA Region 3.)

Porter’s 13 WL referred to radon levels found in the home of Stanley Watras of Boyertown, PA. Watras, a construction engineer, had set off radiation monitors while entering the Limerick nuclear power plant where he worked, and the source of the radiation had been identified as his house.

## Early Actions

EPA’s radiation experts quickly realized that the discovery of radon in the Watras house probably would mean an extensive monitoring program in the Reading Prong. “It would have been too much of a coincidence to expect that the only homeowner with high radon readings was an employee at a nuclear power plant,” says Belanger. “If it was a naturally occurring problem, there had to be more houses with it.”

One of the first concerns of state and federal officials in the monitoring program was whether to use protective equipment for the monitoring team. Normally, workers who knowingly go into areas with high contaminant levels wear such equipment, and homes with 10 to 20 WL are considered to have very high levels.

“But if you were a homeowner, what would you think if we showed up at your door in gas masks and said we wanted to take radon readings in your home?” asks Belanger. The EPA field staff finally decided to work without protective equipment. They reasoned that, even if they entered a few houses with high radon readings, their length of exposure would be too brief to have a significant health effect.

## Working in the Reading Prong

At the request of Pennsylvania environmental officials, Belanger joined the field monitoring effort in April 1985 to take radon measurements in the Reading Prong.

The first step in measuring radon is to take a screening measurement to determine the highest level in the house. EPA recommends that this reading be taken in the basement or the lowest part of the house during the heating season or some other time when the house is closed. If this reading is

low, radon can usually be dismissed as a problem.

If a high level is found, however, further measurements are taken in the most frequently occupied parts of the house. Only after these additional readings are completed is it possible to tell the extent of the radon problem.

“But it’s up to the homeowner to decide what will be done,” says Belanger. “We can make a recommendation as to what level the homeowner should shoot for. We have been recommending the .02 WL, but the homeowner doesn’t have to accept that. He may not be willing to spend the amount of money needed to reach that level. Or, perhaps he is not satisfied that .02 WL is safe enough, and he wants to go lower. He may decide he is willing to give up regular use of his basement. All these things are alternatives that only the homeowner can and should decide.”

## Remediation Research

Helping homeowners decide what to do is another part of EPA’s Radon Action Program. The Agency has embarked on an intensive research project in the

*Hole in the floor of a house under construction is an entry point for radon. The hole—a result of standard construction practices—will probably be hidden by floor covering when the house is complete. Other common radon entry points are sump pump holes, crawl spaces, and cracks in foundation slabs. “If we can easily find the entry places of radon,” says EPA expert Bill Belanger, “the control costs are usually reasonable.”*

Checking his watch, Bill Belanger times a five-minute indoor air sample for radon testing.

Reading Prong to try various radon reduction methods in a variety of houses representative of those found most often in the area. The project is designed to find affordable as well as effective radon reduction techniques.

According to Belanger, the costs of radon removal can vary greatly. "If we can easily find the entry places of radon, the control costs are usually reasonable," he says. "The job can often be done for a thousand dollars or less."

"On the other hand," he warns, "if the house already has a finished basement or there is nothing obvious to do, it may cost many thousands of dollars because you may have to make major structural changes."

EPA also has found that the higher the level of radon in a house, the higher the costs of control. "If you have 0.2 WL in the house and you want to get down to .02, that's a 90 percent reduction," says Belanger. "That's not too hard to do. But if you have 2 WL and want to

get to .02, that's a 99 percent reduction."

EPA has looked at many reduction techniques that reduce radon by about 90 percent. But it is difficult to predict exact costs until the construction of the house is determined. It's also difficult to be sure that control measures work all the time. Take, for example, Belanger's October 1985 visit to Boyertown, PA, with a U.S. Senator who was inspecting one of the homes in EPA's remediation research program. It turned out to be a classic example of Murphy's law that anything that can go wrong, will.

Belanger recalls that, after explaining to the Senator some of the things that had been done to the house, he was asked to take a radon measurement.

"This home originally had a concentration of 7 WL," says Belanger, "and my own measurements taken soon after the house was fixed showed only a little above 0.02 WL. But this day, I got a measurement of 3 WL!"

"All of us there—the Senator, the homeowner, and I—realized something was very wrong," Belanger continues. "Since the highest reading was previously in the basement, I went down there to take a reading. It was 15; more than twice as high as the house had been before we did anything to it."

"At this point, the homeowner was at the point of tears," says Belanger.

After the Senator left, Belanger spent some time looking around the house and found a bedroom window open on the downwind side of the house. No other windows were open, yet air was rushing out of that window.

"I figured that, since the rest of the house was sealed, the air going out must be coming in through the foundation, bringing radon with it." Belanger closed the window, went down to the basement, and opened up one of the basement windows on the upwind side, allowing fresh air to enter the house. Within an hour, the level of radon had been reduced by a factor of two.

That afternoon state officials took more measurements, and the level had dropped to under 0.1 WL. They returned the next day and took readings under .01 WL—well within the state and proposed federal guidelines.

Says Belanger of the experience, "We learned a lot that day. And not just that things can go wrong at inopportune moments. Most importantly, we learned that open windows and air currents can have a dramatic effect on radon control systems."

#### Working with Citizens

Despite occasional events like the Boyertown visit, Belanger has nothing but positive things to say about his experiences working with people who have radon problems.

"All of us from EPA working there have an enormous amount of sympathy for the people we meet with high radon levels in their homes," says Belanger. "We would like to help every one of them individually. But we just can't. There aren't enough of us. Our primary job must be to provide advice and assistance to the states so that they can help everyone with a problem."

The most important thing in providing help, he believes, is getting the people's trust. "They believe you and accept your help if you give it to them straight," he says.

"If you try to mislead them in any way, if you try to minimize the problem or make it sound more serious than it is, they pick it up right away. People living up there (in the Reading Prong) have spoken to others about the problem. They know the background. So, you can't throw bull at them.

"I feel very good about my work there," says Belanger. "It's like working as a medic in an ambulance. You can point to the people you've helped. This is what drives you. You feel like you're saving lives. That's the real motivation in a job like this." □

