

Radon Regulation Update

While model codes slowly grapple with radon provisions, forces in the marketplace are demanding radon-controlled houses now

by Richard Jordan

A 1988 U.S. government advisory recommended that homeowners have their homes tested for radon gas. It further recommended that homeowners have any dangerous levels corrected. Since then, however, the problem has largely slipped out of the public's view.

This lack of front-page exposure shouldn't lull builders and remodelers into thinking the radon issue is fading away. Quite the opposite is true. Some states are passing radon-mitigation laws. The U.S. Environmental Protection Agency (EPA) itself is developing model construction guidelines to reduce radon infiltration into buildings.

No states yet have laws or building codes that mandate radon testing, mitigation, or prevention. However, Pennsylvania, Florida, Minnesota, Iowa, and New Jersey are considering requiring radon testing in all real-estate transactions. And New Jersey now requires builders to use radon-preventive building techniques in new construction in high-risk counties.

Regardless of code requirements, in every state economic pressures are beginning to force builders to recognize and respond to radon issues. I call this the "Golden Rule of Radon": He who has the gold makes the rules.

Relocation Companies Take Lead

The golden rule began to evolve several years ago with corporations and their third-party relocation companies. These large employers, which frequently transfer workers among cities, either buy a transferred employee's home or contract with a relocation firm to do so. The public's radon awareness began to change when these corporations and relocation firms decided not to buy homes if tests indicated a potential radon problem. Last year the Employers Relocation Council advised all its members that radon testing should be a standard part of relocation policy.

Then and now, many employees cried foul. EPA screening procedures call for tests under worst-case conditions—winter conditions, with doors and windows shut, providing no escape for radon gas. Employees argue that the tests indicate only whether additional testing is necessary. They point to EPA protocols that call for a one-year test if radon is between 4 and 20 pCi/l. They can't understand why everyone gets so excited about these readings since the EPA states that homes within this range should be repaired "within a few years."

Corporations typically say they will not buy a home until it tests below 4 pCi/l, but a few employers will not buy a home if it has ever tested above 4

pCi/l. Companies are simply saying that because they have the "deep pockets" when it comes to liability, they are not willing to accept the potential exposure they incur if they knowingly sell someone a house that might test above EPA's "action level" of 4 pCi/l. Some are so cautious they even pay for measures to prevent tampering with test equipment.

Some mortgage lenders are starting to take the same approach. Although lenders do not require radon tests as part of their underwriting, it is only a matter of time before they do. In the meantime, lenders do require the repair of "known defects."

What this means to the builder is that sellers who were forced to mitigate radon in their old homes will insist that their new homes be as free of radon as possible. They don't want to lose out again. Some sellers, wary of future radon problems, insist that the home pass a short-term test below 2 pCi/l.

Building trade associations, including the National Association of Home Builders, are advising builders to prominently disclaim radon in their contracts and warranties. In essence, they're telling builders to warn buyers that they, as builders, will not warrant anything dealing with radon. Radon problems would become the responsibility of the owner. From a legal stand-

point, that appears to be sound advice. But in the marketplace, it ignores a crucial factor: Buyers invoke the golden rule, saying, in effect, "If you won't build me a house that's radon-free, I'll find a builder who will."

Radon Abatement Law

Since October 1988, the U.S. has had a comprehensive law, the Indoor Radon Abatement Act, which indicates that, as far as a Congressional concern, radon is here to stay. The very first paragraph states: "The national long-term goal of the United States...is that the air within the buildings of the United States should be as free of radon as the ambient air outside of buildings." The standard for outdoor ambient level is 0.2 to 0.5 pCi/l.

While this is an unrealistic goal for the near future, the directive Congress sent to the EPA was to stop giving the American public the false idea that 4 pCi/l is safe. According to many leading scientists, if a person spends 75 percent of his or her time at this level, it would be the equivalent of receiving 300 chest X-rays per year or smoking one-half pack of cigarettes per day. This clearly means that although a builder may represent a house as meeting the EPA radon standard of 4 pCi/l radon standard, he should not represent it as safe.

Of particular importance to builders is the portion of the law that instructs the EPA to develop model construction standards for controlling radon levels in new buildings. This includes homes, apartments, schools, nursing centers, and child-care centers. These standards will apply not only to new construction but also to remodeling projects where buildings undergo major modifications to foundations or air-handling systems. The guidelines will be available for public comment in June 1990, and will eventually be incorporated into building codes.

Model Codes

Since February 1989, representatives from major code organizations have met several times with members of the Department of Housing and Urban Development, the American Concrete Institute, universities, and other organizations to discuss model codes. Participating are the International Conference of Building Officials (ICBO), the Building Officials & Code Administrators International (BOCA), the Southern Building Code Congress International (SBCCI), and the Council of American Building Officials (CABO).

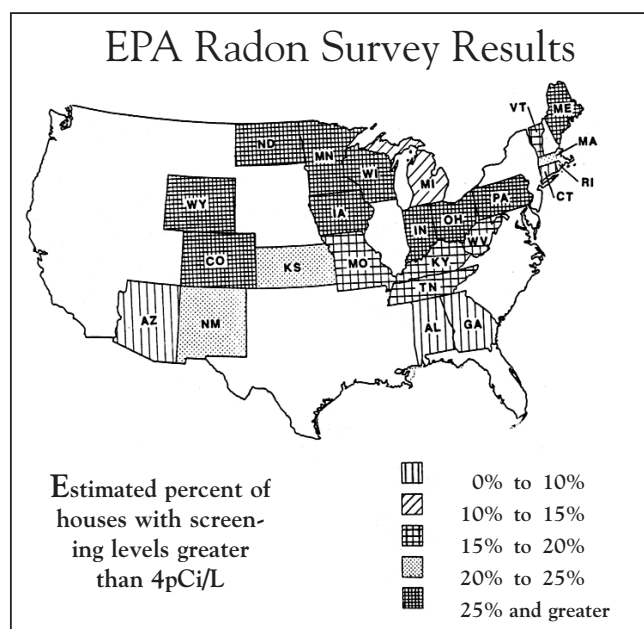
Mailed with the first draft in 1989 was a letter from Margo Oge, EPA Radon Division director. She wrote: "Preliminary but very limited data leads us to believe that 1.5 to 2 pCi/l may be a reasonably achievable goal for new construction, but any number is now and must continue to be subject to change as we attempt to reconcile evolving technological capability, health risk, and the national goal of achieving indoor radon levels no higher than ambient outdoor levels." EPA officials as late as February said they believe 2 pCi/l is a reasonable goal.

The National Institute of Building Sciences is working on construction guidelines that closely resemble the EPA model code except that they allow local building authorities to set the radon levels that must be met on a long-term test.

The Bonneville Power Administration released the nation's first model radon code, called the Northwest Residential Radon Standard, in September 1989. Three months later, New Jersey published a proposal for a Radon Mitigation Sub-Code that would amend its Uniform Construction Code. At press time, the SBCCI is helping builders in Florida meet that state's developing radon regulations.

Here are highlights of the model codes:

Northwest Residential Radon Standard. The builder would have his choice of a performance or prescriptive option. The performance option would



The EPA has conducted random testing in many states to see how many homes have radon levels above 4.0 pCi/l — the level at which the EPA recommends corrective measures. A more complete map with more states included is due out late this summer. Also, more detailed state maps showing hot spots are available from the EPA.

require that the building pass a long-term (one-year) radon test under 4 pCi/l. A short-term test is not mandated, but if a short-term test is performed, results must be recorded and the EPA follow-up protocols used. Houses with an annual average over 4 pCi/l would have to be mitigated within 30 days of the test. This test would be paid for by the person who obtained the building permit. The prescriptive option, on the other hand, would mandate that the builder include certain radon-resistant building techniques during the construction phase of the project. Follow-up tests would not be required for this option.

The EPA Model Standard. The EPA's model "standards and techniques" propose two prescriptive options. Option 1 would require the builder to include a number of radon-resistant building techniques including an active (fan-driven) sub-slab and/or sub-soil depressurization system (see "Radon Ready Construction," below). As with the prescriptive Northwest standard, radon testing would not be required. Option 2 would prescribe most of the basic requirements of Option 1, but without an active system. Option 2 would call for a long-term test of no more than one year. If the result of this test were to be above 2 pCi/l, then the builder would have to activate the "stubbied-in" radon removal system. Subsequent radon testing would be at the option of the building occupant. The builder's responsibility for radon control would cease after he activates the radon-removal system.

Since installation of a radon fan takes only a few minutes, proponents of this plan say builders would most likely install one and forego the need to hire a testing service.

Builders will get some guidance from the EPA as to where radon hot spots are when it publishes a national map this summer that defines such areas. The map on previous page is a preliminary version, and it gives some indication of test results in a limited number of states.

New Jersey Code Amendment. The proposed New Jersey amendment to the Uniform Construction Code is strictly prescriptive and applies only to counties that the state designates high risk. It was near completion at press time. The proposed standards were drawn with the help of the New Jersey Builders Association and are based largely on the EPA model standards.

The code amendment attempts to passively prevent radon from entering buildings and includes features that would allow for easy upgrading of a vent-pipe system by installing a fan outside or in an attic. It would not require the builder to test or pay for adding a fan to a passive mitigation system, but would leave that decision up to the buyer. If a builder agrees to meet a certain radon level, then that contract supersedes the code. The New Jersey code would allow some pipes to be capped in the basement.

Typical Cost: \$500 to \$1,000 Per Home

Minimally, a builder would be wise to begin to incorporate the New Jersey measures or the similar EPA-backed measures into the homes he builds if for no other reason than to avoid lost sales. More importantly, he may avoid future liability. Many progressive builders already use these techniques, which appear in EPA and NAHB documents that are nearly two

years old. These documents might be used in the future to prove negligence by builders.

None of the proposed codes require skills or equipment that are outside the capabilities of the average builder. Most of these measures can be accomplished for less than \$500 in the average home. A builder can make excellent use of these measures by advertising low radon levels as a positive feature.

Homes with active radon prevention measures will have no problem meeting the proposed 2 pCi/l guideline and should test well below 1 pCi/l. If a builder is unsure of his ability to offer a warranty, experienced radon mitiga-

tors in nearly every community can help a builder develop his own radon program. Most radon contractors guarantee their work and would do the entire project for less than \$1,000 per home. This year, EPA will publish a list of contractors who have attended mandatory training courses and have passed a comprehensive examination. EPA calls this its Radon Contractor Proficiency Program.

Many of the people getting into the radon mitigation business are builders who found they could develop a profitable sideline business by helping other builders solve radon problems. They have expanded quickly to offer

repairs on existing homes. Radon mitigation is a year-round business that can keep employees busy even during inclement weather.

The builder must settle in his mind not whether he believes radon is a true health risk or whether to demand proof that radon kills people, but whether he can prepare himself to meet the growing demand for low-radon housing and protect himself from liability. ■

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Radon-Ready Construction

In its latest but still unapproved model radon standard, the EPA recommends techniques that vary by foundation design:

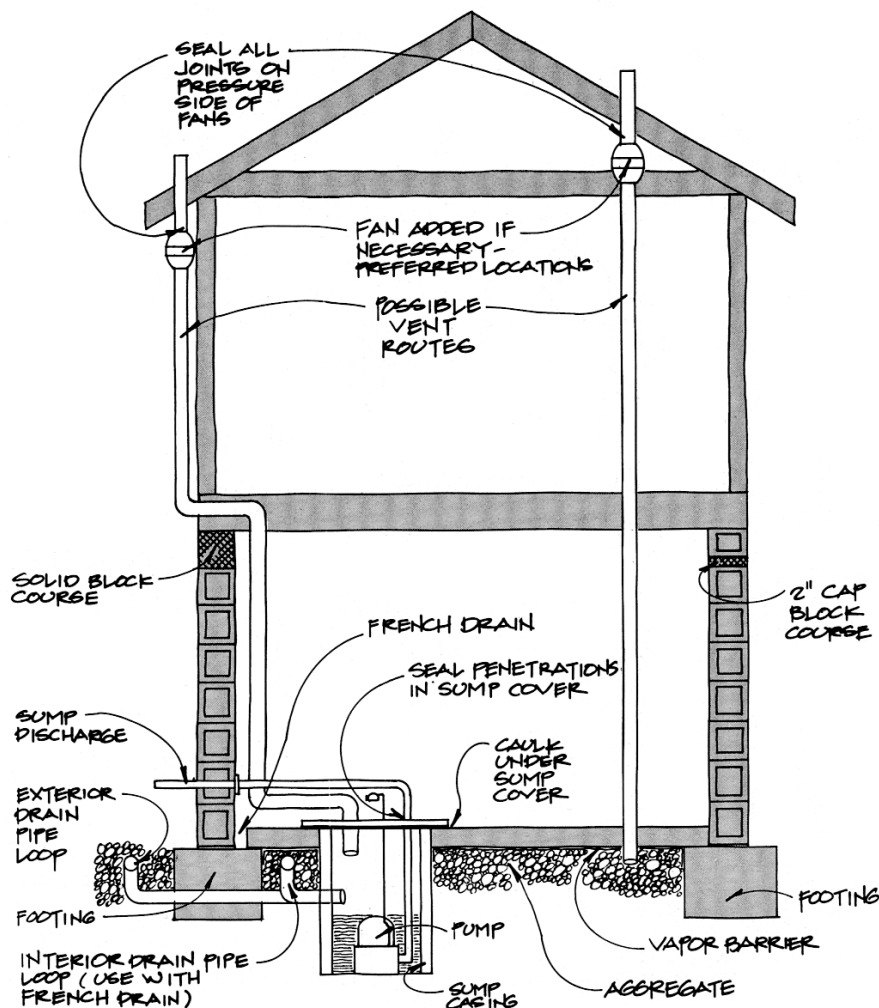
Basements and slab-on-grade construction would require a three-step process. First, builders must minimize soil-gas entry by sealing joints, cracks, and other openings in slabs, below-grade walls, and floors, including sump-pump openings. They also must include gas-retarding barriers, such as polyethylene membranes under floors and parging on outside walls. Second, they must either install an active, fan-

driven radon-removal vent-pipe system or rough in a passive system, which can be activated later with the addition of a fan, most likely in the attic. Third, they must reduce the "stack" or "chimney" effect in basements, which can draw soil gas into the home. This chimney effect is countered by closing air passages between floors and providing make-up air from outside for combustion devices and exhaust fans.

Crawlspaces would require the diversion of radon before it reaches the living space. Builders would have

to vent—actively or passively—the space to outside air and block radon's entry by covering soil with polyethylene membrane or concrete, and by sealing the tops of block foundation walls. Openings in floors and ductwork could be sealed with caulks, foams, and tapes.

Combination foundations would require using those techniques appropriate to each part of the foundation. Where foundation segments join, any resulting potential entry routes, such as joints, doorways, or openings, would also have to be sealed.—R.J.



The EPA has recommended these techniques in new homes since 1988, and it will include many of them in its new model "standards and techniques" due out this summer.