



# EPA develops radon standards

EPA solicited expert comments on its new draft standards for radon prevention techniques in new residential buildings

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The U.S. Environmental Protection Agency (EPA) recently met with representatives of the building industry and governmental organizations in a roundtable format to discuss the residential radon issue. The EPA is about to release the first draft of its *Model Standards and Techniques for Controlling Radon in New Buildings*, so it is seeking advice on ways to accelerate the adoption of the standards into building practices and the nation's building codes.

The roundtable discussions focused on the experiences, concerns and liability questions of the building community. Several representatives of state and local governments also shared their experiences in dealing with radon situations.

## Background

The radon issue first emerged a decade ago when high levels of radiation were discovered in several Pennsylvania homes. Since then, it has been found that the potential for radon exposure is present in a large portion of the United States.

Briefly, radon is a colorless, odorless gas that is a radioactive product of naturally occurring uranium in subsoil and rock. Radon gas may escape through the earth's surface and concentrations of it may accumulate in buildings.

Estimates of the annual death rate from exposure to radon range from 7,000 to 20,000. However, these estimates are based on data accumulated from occupational exposures of uranium miners, and there is disagreement over its applicability to residential environments.

The EPA has established an action level for radon concentration of 4 pico-Curies per liter (pC/L). If concentrations of radon gas in a building or room reach this level, remedial actions should be taken to reduce the level. However, this action level

should not be considered risk-free because some experts relate the risk at the 4 pC/L level as being equivalent to smoking 10 cigarettes per day.

## Building surveys

Geological surveys have identified the radon potential over the United States. Some building measurement surveys have also been conducted.

The EPA estimates that 1 in 15 homes have radon levels above the 4 pC/L action level. The agency also believes that all homes in high-risk areas, as well as basement and first-floor school rooms, should be tested.

However, the identification of a problem building cannot be predicted even in an area of high radon probability. For example, in a 10-state survey of homes, the worst house discovered in the entire survey occurred in a state with the lowest overall average.

## Mitigation procedures

When a building has been identified with elevated radon levels, mitigation procedures should be undertaken, according to the EPA. Such procedures would include, for example, sealing the structure exposed to or in contact with the ground. In some situations, a special system may be necessary to vent the radon gas.

In 1991, the EPA issued interim standards addressing mitigation techniques and procedures in existing structures. In homes, both slab and crawl-space constructions are addressed.

The costs of mitigation procedures and techniques vary depending on the nature of the structure and the elevated levels of radon. These measures would be much less expensive if incorporated at the time of construction.

## Preventive measures

The EPA's draft document, *Model Standards and Techniques for Controlling Radon in New Buildings*, also includes basic radon prevention measures. Incorporating these measures in a building at the time of its construction would increase construction costs minimally.

Techniques for sealing buildings from subsoil effects are already required in some states for moisture control and energy conservation. A radon vent stack through the structure may be more easily accomplished at the time of construction. Such a stack might be passive in nature or may be later equipped with a fan, if needed.

## EPA standards

The EPA draft standards may include about 20 radon prevention techniques and procedures. These standards reflect several years of effort in interacting with the building community and private standards-developing organizations.

The standards' applicable provisions vary depending on a geographical area's natural radon potential. In high radon areas, passive measures should be required; in medium radon areas, only selected provisions may be necessary; and in areas of low expected radon levels, no measures may be needed.

When the standards are finalized, EPA plans to encourage their implementation in new buildings by several methods: a voluntary builder incentive or education program; inclusion of provisions by the nation's model codes organizations; and adoption of the updated model codes by state and/or local jurisdictions.

Following its review of the information received in the recently ended public comment period, the EPA expects to publish the final standards in late 1993. ■