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# EPA's Radon Policy Explained

by *Margo T. Oge, Director,*  
*Office of Radiation & Indoor Air;*  
*US Environmental Protection Agency*

As a way of summarizing EPA's radon policy and its development, I'd like to outline the agency's voluntary radon program and its responsibilities as directed by Congress in the Indoor Radon Abatement Act of 1988.

First, EPA recommends that people living below the third floor spend as little as \$20 to test their homes for radon. Second, EPA suggests that those who find high levels (estimated to be six percent of US homes) spend about \$1,200 to reduce their radon levels below EPA's recommended action level of four **picoCuries** per liter (**pCi/L**). All recommendations are voluntary. People decide if they want to test, and if necessary, fix their home to reduce radon levels. However, as many as 15 states now require some form of radon information as part of residential real estate transactions.

The reasons that we urge these voluntary steps are clear: the carcinogenicity of radon is based on extensive human data from epidemiologic studies of underground miners. The studies have consistently shown association between radon exposure and increased lung-cancer risk, and radon has been identified as a serious environmental health risk. These findings have been well established by the science community, including the World Health Organization (WHO), the National Academy of Science

(**NAS**), the International Commission on Radiological Protection (ICRP), and the National Council on Radiation Protection and Measurements (NCRP).

EPA cannot verify an 'absolutely "safe" level of **radiation** for the public; therefore it's prudent to reduce one's exposure to radon when possible. This conclusion is based on the current scientific consensus and evidence that there is no exposure "threshold" for radiation. There is wide support by mainstream scientific organizations such as NAS, ICRP and NCRP for a linear dose-response relationship for cancer at low to moderate doses of alpha radiation. An additional limitation in estimating radon risk is the uncertainty in extrapolating radon exposure and dose in mines as opposed to homes. An while uncertainty exists in all risk assessments, continuing scientific research has helped refine EPA's projection of lung-cancer risk. EPA's estimate that about 7,000-30,000 lung-cancer deaths per year in the United States result from residential radon exposure is derived from NAS' BEIR V Report.

## Setting **the action level**

EPA selected four **pCi/L** as an "action level" for recommending remediation measures based on the availability of economical reduction technologies. Currently available technology can reduce elevated home radon levels to four **pCi/L** at reasonable costs -- that is, for an

average of about \$1,200 -- virtually all **of the** time. Technology is able to reduce radon levels to two **pCi/L** or below an estimated 70 to 80 percent of the time.

EPA has evaluated lower and higher action levels. However, lower levels (such as two **pCi/L**) currently are not reasonably achievable in 20 to 30 percent of homes, and measurement uncertainty increases at these levels. Higher action levels (such as the 20 **pCi/L** used in Canada) ignore substantial risks that can **be** prevented cost-effectively with current testing and mitigation technology -- especially for smokers and former smokers who are at even higher risks from radon due to the synergism between radon and smoking.

Some have suggested that the risks below 20 **pCi/L** are too insignificant to warrant attention. But focusing solely on those above a 20 **pCi/L** level would address only two percent of the population's risks nationwide. While understandably these risks are more serious, focusing on them only would leave millions of Americans uninformed and exposed to substantial and preventable health risks from radon.

EPA has conducted extensive analysis on the costs and benefits of its radon program strategies. We estimate that a fully implemented action level of four **pCi/L** could prevent more than 2,060 **lung-cancer** deaths annually at a cost of \$700,000 per life. This cost falls within the range for other voluntary safety

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programs, such as smoke detectors and seat belts. In contrast, EPA estimates a fully implemented action level of 20 pCi/L could prevent only about 220 lung cancer deaths annually.

### **Testing strategy**

EPA regards long-term radon tests (more than 90 days) as the best means to estimate an individual's annual exposure to radon; however, numerous studies have shown that consumers are unwilling to take long term tests due to various constraints. After extensive research and review by its science advisory board (SAB), EPA has also determined that short-term radon tests (two to seven days) can be used to make home mitigation decisions. EPA recognizes that short-term tests cannot always predict the average radon level in a home; however, more than 90 percent of the time two short-term measurements in the living area can predict whether a home's annual average is above four pCi/L. Short-term tests should be simultaneous or consecutive.

Some contend EPA should not target its efforts on smokers because they have already significantly increased their lung cancer risk by smoking. This ignores the fact that smokers and former smokers can further cut their lung cancer risks by reducing their radon exposure. This notion also disregards the principle that smokers are entitled to the full range of our nation's public health services.

EPA's priority is to reach highest-risk populations, including smokers, and to target geographic areas identified for high radon potential. Since the EPA's radon program began in 1986, we have conducted residential screening surveys to identify the relative magnitude of the radon problem by state and in "hot spots"

within a state. Since that time we have worked with the states to focus resources on the areas of highest risk. These efforts have resulted in twice as much testing in high-radon areas compared with other states.

Since 1988 we have worked with the US Geological Survey (USGS) to combine these screening data with other geographic, soil and housing construction data to develop a national map of radon zones. Currently we are working with both the USGS and the Department of Energy to develop a model that more closely pinpoints high-radon areas.

### **Refining the program**

The radon program continues to involve the scientific community and other in the development and implementation of policy. In particular the EPA has relied on its independent science advisory board as well as the National Cancer Institute and the Centers for Disease Control and Prevention. EPA's current risk assessment on indoor radon is based on a methodology fully endorsed by the SAB. The EPA is committed to refining the science and recently commissioned NAS to update its analyses of miner studies and to review residential studies of radon risk.

EPA's radon program has undergone extensive peer review from internal and external experts. In 1992, the Government Accounting Office (GAO) published its findings after an extensive review. GAO recommended to EPA's administrator that the radon program increase public action by sustaining a national information and education effort, focus on testing during real estate transactions, and promote new home constructions that is radon-resistant. In 1991, more than 40

external radon experts were invited to participate in a radon review, and while some disagreed with the prevalent thinking about radon risk, all opinions were instrumental in formulating the panel's recommendations for the radon program. EPA is now implementing the suggestions of these panels.

To date only 300,000 homes have been fixed out of an estimated six million. However, EPA's radon program compares very well with other campaigns to spur Americans to take voluntary action.

Efforts to get Americans to stop smoking or buckle up or use a designated driver were slow-going at first as well. Although Americans are ruggedly individualistic when it comes to heeding their government's wishes, they often recognize a bargain when they see one, such as spending little money for years of healthy lungs and living.