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Improvements Needed in the Environmental Protection Agency's Testing Program for Radon Measurement Companies

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Before the
Subcommittee on Superfund, Ocean and Water Protection
Committee on Environment and Public Works
U.S. Senate

Mr. Chairman and Members of the Subcommittee:

We are pleased to present a statement for the record that discusses (1) our report[1] on the Environmental Protection Agency (EPA) program that assesses radon measurement companies' competency, and (2) the results of our current review on changes needed in this program to provide homeowners with greater assurance that radon measurements are accurate, and on state efforts to control radon measurement companies. This work was done at the request of the House Committee on Science, Space and Technology and the results were presented in testimony before the Committee's Subcommittee on Natural Resources, Agriculture Research, and Environment on May 16, 1990.

Radon, a naturally occurring, colorless, odorless gas has been shown to cause lung cancer. EPA estimates that 20,000 lung cancer deaths each year can be attributed to indoor radon. As a result, EPA and the Public Health Service have advised residents to test their homes for radon and take action when elevated levels are found.[2] In 1986, to help ensure that homeowners obtain accurate radon measurements, EPA published procedures for taking radon measurements and established the voluntary Radon Measurement Proficiency (RMP) program. More recently, Congress passed Public Law 100-551, commonly referred to as the Indoor Radon Abatement Act of 1988, which directed EPA to undertake a variety of activities to

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[1]Air Pollution: Uncertainty Exists in Radon Measurements (GAO/RCED-90-25, Oct. 16, 1989).

[2]While EPA maintains that no safe level exists, the agency recommends that homeowners take action whenever annual average radon levels are believed to be greater than about 4 picoCuries per liter of air. EPA estimates that the risk of being exposed to annual radon levels of 4 picoCuries is comparable to smoking half a pack of cigarettes each day.

address the radon problem. A number of these activities including the RMP program, were already underway as part of EPA's radon efforts.

The RMP program assesses the capabilities of companies providing test results to homeowners. The objectives of the program are to (1) assist the states and the public in selecting companies that have demonstrated competence in measuring indoor radon, and in the long-run (2) provide assurance to the public that companies' test results are accurate through the use of standardized measurement and quality assurance procedures. To achieve these objectives, EPA envisioned a federal/state approach. EPA would be responsible for testing the proficiency of firms, whose participation in the program would be voluntary, and would encourage firms to adopt quality assurance procedures. The states, according to EPA officials, would determine any additional regulation of firms such as mandatory participation in the RMP program and mandatory adoption of quality assurance programs.

OVERVIEW

EPA has made considerable progress in achieving the initial objective of the program. Since 1986 EPA has assessed companies' competency in measuring radon on six occasions. It has also published the results in national reports that are distributed throughout the country and in individual state reports. The reports list the companies that have demonstrated proficiency and device or devices they used to demonstrate it. The number of firms demonstrating proficiency through the RMP program has grown dramatically. For example, 24 firms demonstrated proficiency in EPA's first test held in 1986 while about 660 firms were listed in EPA's latest proficiency report (issued in January 1990). Of the 660 firms, EPA lists about 260 as national companies.

Even with the increased number of firms demonstrating proficiency in measuring radon, EPA and the public still cannot be assured that all companies meet proficiency standards or that measurement results are accurate on a day-to-day basis. As we reported in 1989, this assurance does not exist primarily because

-- the voluntary nature of the program allows firms to market measurement devices that have not been tested or that failed a test and

-- the program does not require measurement companies to implement quality assurance programs that ensure quality measurement results on a day-to-day basis, and, consequently, companies may be providing homeowners with inaccurate results.

Further, only a limited number of states have assumed the responsibilities EPA envisioned in the federal/state approach. Our current work shows that only nine states have developed programs that provide some regulation of radon measurement companies.

BACKGROUND

Radon occurs naturally almost everywhere. Current estimates are that the average U.S. home contains about 1.5 picoCuries of radon. Several different devices are available to measure radon levels in the home. For example, the popular charcoal canister measures radon over 2 to 7 days. Another popular device, the alpha track detector, measures radon for longer periods such as 3 months to a year. Both devices, which can be purchased from various retail outlets, must be sent to laboratories for analysis after being exposed to radon. Some more costly devices that require skilled operators, such as the continuous radon monitor, can measure radon and provide more immediate results without laboratory analysis. Companies that provide the laboratory

analysis results or the results through the use of instruments used by a skilled operator are tested through the RMP program and are called primary companies.[3]

To pass the RMP program and be listed in the proficiency report, EPA requires a primary company to (1) follow the appropriate measurement protocols, (2) demonstrate the ability to get test results to the proper homeowner, and (3) demonstrate the ability to measure radon to within 25 percent of actual levels. To meet the first requirement, EPA generally relies on a company's statement in the application that it follows the protocols. To meet the second and third requirements, companies must pass a proficiency test, which includes correctly analyzing devices exposed to known levels of radon and reporting the results to EPA for verification.

FIRMS MARKET DEVICES WITHOUT MEETING RMP REQUIREMENTS

In October 1989 we reported that 87 percent of the devices companies had tested in the RMP program in 1988 met the RMP requirements, thus demonstrating a minimum level of competency in measuring radon. However, we also reported that the voluntary nature of the program allows firms to market devices that fail the program or that have not been tested in the program. When companies are allowed to market devices without demonstrating a minimum level of competency in measuring radon, consumers have no assurance that they are receiving accurate results. In fact, in a few of the cases cited below it appeared the companies may have been providing homeowners with inaccurate measurements. The

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[3]Primary companies either have laboratory capabilities to analyze radon measurement devices after they have been exposed to radon or measure the radon levels and analyze the results with their own instrumentation and operators. Secondary companies provide services ranging from distribution of radon devices to home inspection and consultation. Secondary companies must use a primary company to analyze the radon devices.

following are cases we reported which illustrate the lack of controls in the RMP program:[4]

-- One large and a few small companies were marketing devices that had not been tested in the RMP program.

-- One large company was marketing a device that did not meet the RMP requirements.

-- Several small companies were marketing devices after failing the proficiency test.

-- A few small companies that tested some of their devices in the RMP program had been marketing other devices that had not been tested in the program.

In addition, a company not in our sample but identified through discussions with contracting personnel, was analyzing devices in its laboratory under another name after it failed the proficiency test.

INDUSTRY OFFICIALS AGREE THAT MEASUREMENT FIRMS SHOULD BE REQUIRED TO DEMONSTRATE PROFICIENCY

One objective of our current review was to address changes in the RMP program that could provide homeowners with greater assurance that radon measurements are accurate. To help answer this objective we interviewed officials from a sample of the radon industry for their views and we found that they generally agreed that all measurement companies should be required to demonstrate

[4]In our review, we sampled all 11 large primary companies (having 30 or more secondary companies) and 100 of the 347 small primary companies (having fewer than 30 secondary companies) that participated in the 1988 testing. The precise estimates can be found on pages 7 and 50 of our Oct. 16, 1989, report.

proficiency in testing radon.[5] Of the 32 interviewed, 27 officials said participation in the RMP program should be mandatory. The reasons given for making participation mandatory included the following:

-- Radon health effects are severe enough to warrant obtaining assurance from companies that they are meeting RMP requirements.

-- The public needs assurance that they are dealing with reputable firms, and the RMP program is the only means available to companies for demonstrating competence in measuring radon.

RMP PROGRAM DOES NOT REQUIRE MEASUREMENT COMPANIES TO HAVE QUALITY ASSURANCE PROGRAMS

An effective quality assurance program is EPA's best assurance that radon measurement firms are performing quality testing on a day-to-day basis. The primary purpose of documented quality control is to assure that the capability demonstrated during performance testing is maintained until the next periodic evaluation, according to the former Chief, Office of Radiation Measurement, National Institute of Standards and Technology.

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[5]We interviewed a judgemental sample of 32 radon measurement industry representatives from 26 commercial, 3 university, and 2 state laboratories and 1 federal laboratory, all of which provide radon measurement services. We pretested our survey instrument with representatives of 3 commercial laboratories. To obtain viewpoints from all types of applicants, we divided the universe of 843 applicants for participation in EPA's 1989 proficiency test into four strata and then randomly selected and interviewed applicants from each strata. We selected 30 applicants, one of which had already been interviewed in the pretest. Information obtained reflects only the views of those interviewed and cannot be considered representative of the entire universe of applicants.

Although EPA recommends certain quality assurance procedures for radon measurement companies, the agency does not require companies to develop and implement such procedures as a condition for program participation. Recommended procedures include: controlled calibrations of measurement devices in a known radon environment, such as in a calibration chamber; background and duplicate measurements; written procedures for attaining quality assurance objectives; a system for recording and monitoring the results of quality assurance measurements; and maintenance of control charts and related statistical data.

If measurement companies do not develop and implement adequate quality assurance programs, they may be providing homeowners with inaccurate results. For example, in our prior work we found that only 12 of 21 companies we interviewed that participated in the 1988 testing were calibrating their equipment. One of the nine companies that did not calibrate its equipment failed the 1988 test with a 100-percent error but had been marketing the measurement device for a full year before the test. After calibrating its equipment, the company retested and passed.

In addition, not requiring measurement companies to implement quality assurance programs seems inconsistent with EPA's agency-wide quality assurance policy for EPA-sponsored environmental monitoring and measurement efforts. This policy requires every measurement project to have a written and approved quality assurance plan and applies to all EPA program offices, regional offices, laboratories, contractors, and grantees.

EPA's own Science Advisory Board has also recommended that the agency require radon measurement companies to maintain documented quality control and measurement procedures for measurement

devices.[6] Specifically, the Board recommended that both detailed descriptions of calibration procedures and calibration data for certain types of measurement devices be submitted with the application for admission to the proficiency testing program.

EPA program officials expressed concern about enforcing a quality control requirement and managing the costs associated with it. Nevertheless, EPA recently established a task force to assess changes that are needed in the RMP program. In a recent meeting, program officials told us that the task force was developing a proposal for changes in the RMP program that would include requiring measurement companies to have quality assurance programs as a condition for participating in the RMP program. In addition, as authorized by the 1988 radon legislation, EPA is developing a user-fee proposal to cover costs of the RMP program.

INDUSTRY OFFICIALS BELIEVE THE RMP PROGRAM SHOULD REQUIRE QUALITY ASSURANCE

Of the 32 officials from the radon testing industry we interviewed, 31 said some quality assurance should be required as a condition for participating in the RMP program. Some of the reasons these officials gave for requiring quality assurance included the following:

-- At the present time, the radon measurement area is wide open to abuse because homeowners cannot see, taste, or smell radon.

-- Quality assurance requirements would force industry to develop good quality control systems and standardize industry practices.

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[6]The Science Advisory Board is a group of independent scientists who review the quality and sufficiency of scientific data underlying regulatory development of some EPA actions.

-- A quality control system is needed as a link between a company's performance on the proficiency test and its everyday work.

STATES' MONITORING OF RADON MEASUREMENT FIRMS IS LIMITED AND INCONSISTENT

Another objective of our current review was to determine the status of state radon programs that exercise control over radon measurement companies. In designing the RMP program using a federal/state approach, EPA envisioned that states, through accreditation or certification programs, would exercise some degree of control over the reliability, consistency and quality of the measurement data companies provide homeowners. According to EPA officials, the agency envisioned that states would make participation in the RMP program mandatory and establish and enforce quality control requirements through state programs. We conducted a telephone survey of radon coordinators in 50 states and the District of Columbia to determine the progress states were making in establishing programs. (See app. I for a summary of the survey information on the status of state radon programs.)

The survey we conducted showed that only nine states have programs that either certify, license, or accredit radon measurement companies. All nine programs have a requirement that radon measurement companies participate in EPA's RMP program or in a similar state-run program. However, only five of the programs are mandatory. Three of the states with voluntary programs are attempting to pass legislation or implement regulations that would make their programs mandatory. The fourth state has no plans to change its voluntary program. Of those nine states that have programs, only five have quality assurance requirements.

An additional 20 states may establish a program in the future. Twenty-two state coordinators said their states probably would not have a program. Two reasons coordinators gave for not having a program were a lack of funding or resources for indoor air problems in general, including radon, and a lack of legislative authority for such programs.

Not only do states vary in whether or not they require mandatory participation in their programs, but they also vary in the number of requirements in their programs. The result is that each program gives a different level of assurance to homeowners regarding the accuracy of measurements. For example, five of the nine programs require companies to calibrate their equipment periodically and follow other quality assurance procedures. Four of nine programs provide for on-site inspection of measurement companies. The only requirement common to all nine programs is for companies to participate in EPA's RMP testing program and/or a similar state-run testing program. (See table I.1, app. I for a comparison of the various requirements of the nine programs.)

Although, we did not attempt in the survey to establish why some states had certain requirements and while others did not, one reason may be the lack of guidance from EPA. For the most part, EPA has not defined the degree of control it wants states to exercise over measurement companies. In a May 1988 report, EPA stated such control could include registration, certification and licensing.[7] According to the report, registration, certification, and licensing differences center around whether the control process is mandatory, whether nonparticipating (e.g., non-certified or non-licensed) firms are excluded from the market, and whether a fee is charged by the state for the process. Licensing is viewed as the most restrictive form of "quality control," while registration is

[7]Key Elements of a State Radon Program, EPA 520/1-88-006, Office of Radiation Programs.

the least restrictive. The report noted that the RMP program illustrates a form of registration with no fee--the least restrictive form of control.

In an April 1990 meeting, EPA program officials told us that the radon task force was proposing that a document describing a model state certification program be developed for guidance to states.

CONCLUSIONS AND RECOMMENDATIONS

Since radon has been identified as a national health problem, EPA and the Public Health Service have advised homeowners to test their homes and take action if elevated levels are found. We believe that to make health-based decisions homeowners need more assurance that the radon test results they rely on are accurate. Homeowners would have greater assurance that radon measurements are accurate if (1) participation in the RMP program were made mandatory, and (2) radon measurement firms were required to meet minimum quality assurance requirements as a condition to participation. In designing the RMP program, EPA relied a great deal on states to develop programs that would exercise some control over the reliability, consistency, and quality of the measurement data companies provide to homeowners on a day-to-day basis. While some states have developed programs, most have not.

We are not opposed to states exercising control over measurement companies. However, to provide homeowners with a minimum level of assurance that radon measurements are accurate, we believe actions need to be taken at the national level. In our May 16 testimony before the House Subcommittee on Natural Resources, Agriculture Research, and Environment, we recommended that the Congress provide EPA authority to require companies to participate in and successfully pass the RMP program before marketing their devices to the public. In addition, to help ensure that radon measurement companies are providing quality measurement

results on a day-to-day basis, we recommended that EPA establish quality assurance requirements for the different measurement devices and, as a condition for participating in the RMP program, require measurement firms to demonstrate that they have developed and implemented programs that will meet the requirements. Finally, to ensure the development of state programs that provide a minimum degree of control and consistency over radon measurement companies, we recommended that EPA develop and issue guidance on the type of state programs and level of control it believes is needed at the state level in order to provide homeowners with adequate assurance that radon measurements are accurate.

STATUS OF STATE RADON PROGRAMS

To obtain a nationwide perspective on how states exercise control over radon measurement companies, we conducted a telephone survey of state radon coordinators in the 50 states and the District of Columbia. The following is a summary of their responses concerning (1) whether radon levels in homes are a problem in their state (2) whether their state certifies, licenses, or accredits companies that perform radon measurements in their state, and if so, the elements included in their program and (3) their states' efforts to provide radon information to the homeowner.

MOST STATES VIEW RADON AS A PROBLEM

Thirty-five of the 51 radon coordinators said they believe radon levels are a problem in their state. Coordinators in the states of Alaska, Arizona, Arkansas, Hawaii, Indiana, Louisiana, Mississippi, Oklahoma, North Carolina, South Carolina, Texas and the District of Columbia said radon was not a problem. Radon coordinators in California, Nevada, New Hampshire, and South Dakota did not know whether radon was a problem in their state.

FEW STATES HAVE ACCREDITATION PROGRAMS

Nine of the 51 state radon coordinators told us that their states have programs to certify, license, or accredit companies that perform radon measurements in their state. The remaining 42 coordinators said that their states do not have such a program. Of the states with programs, five have mandatory programs: Delaware, Florida, Iowa, Pennsylvania, and Virginia. The four states with voluntary programs are Kentucky, Nebraska, New Jersey, and North Dakota. All nine states publish a list of proficient radon testing companies.

Coordinators from 20 of the 42 states that do not have radon measurement accreditation programs expect their states to have programs in the future. Six of the 20 coordinators anticipate having programs within 1 year, 4 others foresee having a program within 2 years, while the remaining 10 expect to establish programs but do not know when. The coordinators for the remaining 22 states without programs do not expect their states to establish programs in the near future. Although these coordinators do not foresee their states establishing a program, 12 of them believe that radon is a problem in their states.

To help defray the cost of the state certification, three states, (Florida, Iowa, and Pennsylvania) are currently charging application fees, and the fourth state, New Jersey, will begin to charge a fee when its state certification program becomes mandatory according to a state official. Iowa is the only state requiring all radon measurement companies to post a bond before operating.

ACCREDITATION REQUIREMENTS VARY IN THE NINE STATE PROGRAMS

We asked the coordinators in the nine states with programs to describe both their requirements for radon testing companies and the state activities that were included in their programs. The number of requirements in the nine programs varied. The only requirement common to all nine programs is for companies to participate in EPA's RMP testing program and/or a similar state-run testing program. Examples of other requirements include the following:

-- Seven of the programs require measurement companies to meet minimum educational requirements for critical personnel.

-- Seven states have established minimum radon experience requirements for a measurement company's critical personnel.

-- Five programs require companies to calibrate their equipment periodically and follow other quality control procedures such as (1) routine checking of equipment accuracy, (2) procedures to ensure that measurement equipment is operating properly, and (3) record keeping.

-- Four programs call for on-site inspection of measurement companies.

The following table compares the requirements of the nine state programs.

Table I.1 Comparison of Program Requirements

State program requirements	Mandatory program FL	PA	DE	VA	IA	Voluntary program NJ	NE	ND	KY	Total
Companies required to participate in EPA's RMP testing program and/or state-run testing program	X	X	X	X	X	X	X	X	X	9
Minimum education required for critical company personnel	X		X		X	X	X	X	X	7
Minimum radon experience required for critical personnel	X	X	X		X	X	X		X	7
Companies required to submit radon test results	X	X	X		X	X			X	6
State program includes radon training for measurement companies	X				X	X	X	X		5
Companies required to calibrate their equipment periodically	X	X			X	X			X	5
Other quality assurance procedures required ((1) routine checking of equipment accuracy, (2) procedures to ensure that measurement equipment is operating properly, and (3) record keeping)	X	X			X	X			X	5
State program calls for on-site inspection	X	X			X				X	4
Companies and radon specialists required to pay a fee	X	X			X					3
State program includes blind testing of companies		X								1
Companies required to post a bond					X					1

STATE EFFORTS TO COMMUNICATE WITH HOMEOWNERS

We asked state coordinators to furnish information on the ways their states communicate with homeowners. All states have some means of communicating indoor radon problems to the public. The

following list summarizes the different ways states are providing radon information to homeowners:

-- 19 states have a radon hotline.

-- 50 states distribute EPA's Citizen's Guide for Radon.

-- 48 states distribute listing of proficient radon measurement companies.

-- 49 states distribute other radon brochures/publications.

-- 3 states run television, radio, or print ads.

-- 32 states use other outreach methods to provide consumers with radon information.

FUNDING FOR STATE RADON PROGRAMS

While 32 states provide some funding for radon activities, only 18 have designated money specifically for radon programs in the state budgets. The remaining 14 states use funds from larger departmental budgets. As shown below, the amount of funds budgeted for radon varied among the 18 states:

-- Four states budget over $1 million for radon (Florida, New York, Pennsylvania, and New Jersey).

-- Five states budget between $100,000 and $1 million (California, Washington, Connecticut, Alaska, and Illinois).

-- Six states budget less than $100,000 (Maryland, Iowa, New Hampshire, Wisconsin, Indiana, and Idaho).

APPENDIX I

-- Three states did not tell us their funding levels (Kentucky, Minnesota, and Tennessee).