1998_02

A RADON CURRICULUM FOR PROFESSIONAL HOME INSPECTORS

Stephen Shefsky
Niton Corporation
Bedford, MA

Robert Juliano
Environmental Science Laboratory
Medway, MA

ABSTRACT

The development of an independent accreditation board creates an opportunity for the radon industry to refine and re-focus training and examination programs for individuals who perform radon testing. Professional home inspectors are key players in the radon industry, constituting the largest group of radon testers. Home inspectors play a crucial role in placing test devices and conveying technical information about radon to home buyers, sellers, and real estate brokers. But radon testing is one among several services inspectors provide. At present only a few inspectors commit the time and effort required to become experts on the subject of radon. Evidently, the existing Radon Proficiency Program does not serve the needs of most home inspectors, since few participate unless they are required to by state law.

To attract inspectors to become accredited radon testers, the program must allow for a well-focused, concise and relevant training course and examination. We propose a compact curriculum that will qualify professional home inspectors to deploy passive radon test devices for laboratory analysis. The course will emphasize protocols for test placement and test conditions, discuss basic facts about radon behavior, health effects, risk communication, and mitigation strategies, and cover significant ethical, legal and business issues related to radon testing and mitigation.

INTRODUCTION

This year marks a turning point for the radon testing industry. Since the mid-1980s, qualifications for radon testers have been defined by the US Environmental Protection Agency (EPA) Radon Proficiency Program (RPP). At present, 18 states regulate their radon testing and mitigation industries through certification and licensing requirements, and most of the regulated states require radon testers to participate in RPP. The EPA plans to discontinue the RPP. For the last several years the EPA and state radon program officials have been working with the radon industry and other interested parties (stakeholders) to develop a privatized radon certification program to replace the RPP. The National Radon Safety Board (NRSB), which emerged from

the stakeholder process, proposes a radon tester and mitigator accreditation program that is controlled by an independent board whose members are drawn from various facets of industry, government, and consumer groups. We expect that a new radon accreditation program will resemble RPP, but will evolve over time to better meet the needs of government regulators, consumers, and the radon industry. It is our hope that a more flexible accreditation program will be able to accommodate some of the ideas we propose here.

Both authors of this paper are associated with radon testing laboratories in eastern Massachusetts. The authors bring to this paper the perspective of RPP-listed analytical service providers in an unregulated state, whose clientele are largely home inspectors and real estate professionals.

HOME INSPECTORS AS RADON TESTERS

Home inspectors play a crucial role in the radon industry. Most residential radon tests today are associated with real estate transactions. To protect the interests of their clients, inspectors have an obligation to determine whether costly repair work is needed, or whether the property has a flaw that affects its value. Certainly, elevated indoor radon concentrations require remedial work, which thus affects the value of the property. Consequently, among the many services offered by inspectors, radon testing has become a typical item. Some inspectors offer radon tests as a standard component of their inspection package, while others offer radon tests for an additional fee. Home inspectors who offer radon testing services bring the issue of radon to the attention of the home buyer, stimulate the buyer's interest in radon testing, and ultimately create demand for radon mitigation services.

Home inspectors are viewed as experts on many topics relating to construction, including structures, mechanical systems, electrical systems, plumbing, and environmental quality. To promote diverse expertise among its members, the premier home inspector association, the American Society of Home Inspectors (ASHI), requires extensive training, experience, and continuing education as a condition of membership.

Radon is one of many topics which compete for an inspector's attention. Some inspectors give radon a high priority, and will seek to acquire whatever training and credentials are available. Inspectors who offer radon testing typically indicate on their inspection reports that a radon test was performed and give the result, or indicate that the radon test was declined. Other inspectors give little or no attention to radon, test only when their clients initiate requests to do so, and do not mention radon in their reports. The authors estimate that at least one half of home inspectors in Massachusetts test for radon with some regularity.

HOME INSPECTOR PARTICIPATION IN RADON PROFICIENCY PROGRAMS

A casual comparison of the RPP residential measurement list to the ASHI-accredited home inspector list reveals that home inspector participation in RPP is very poor in unregulated states. In Massachusetts, an unregulated state, only 11 individuals are presently RPP-listed for residential measurements (see Table 1). Of 83 ASHI-accredited home inspectors in Massachusetts, only 3 also appear on the RPP list. In regulated states, where RPP listing is a requirement for radon testers, the participation in RPP is much greater. Rhode Island, a regulated state, has nearly twice as many RPP-listed testers as Massachusetts, despite having one-sixth the population. In Rhode Island, RPP testers greatly outnumber ASHI inspectors!

It is evident from the numbers in Table 1 that given the choice, few home inspectors voluntarily participate in the present RPP. The authors of this paper count among their clients dozens of non-RPP-listed inspectors. Clearly, the home inspectors in unregulated states feel that the costs of participating in RPP outweigh the benefits. Costs of participation include direct fees; time, effort, and expenses required to attend training courses, study for the exam, meet RPP continuing education requirements, and satisfy added paperwork requirements. Since the nearest regional radon training center is at Rutgers University in New Jersey, and since approved radon courses and exams are rarely offered in New England, the cost of RPP participation may include the significant time and expense of long-distance travel. This is a heavy burden for typical home inspectors, for whom radon testing may be a small part of their business scope.

RADON ACCREDITATION FOR HOME INSPECTORS

To attract wide participation among home inspectors, an accreditation program must meet the needs of the inspectors. The training course and exam must focus on the practical basics of radon testing, so as to educate the inspector to perform the task with competence. The training should be readily available, convenient, and reasonably priced. The program should offer significant benefit to the inspector beyond the educational value, by awarding a well-recognized, meaningful credential, as well as ASHI continuing education credits.

Home inspectors are for the most part highly skilled professionals. They bring to the training course a great deal of technical knowledge and experience on construction practice, building design, and communication among real estate buyers, sellers, brokers, and other parties. Generally speaking, home inspectors are exceptionally well-suited to become radon testers. Many inspectors who presently perform radon testing with competence have had no formal training on the subject. It is the opinion of the authors that most home inspectors have adequate background and experience to become competent radon testers in a very short training period. It is our opinion that a one-day course of carefully selected content should adequately train professional home inspectors to deploy and retrieve passive radon tests in accordance with EPA radon testing protocols.

CONTENT OF COURSE

This proposed introductory radon testing course for home inspectors covers many, but not all, topics covered by the present RPP-approved 16-hour Radon Measurement Operator course. The proposed course covers only passive measurement methods that are suitable for laboratory analysis and reporting. This course may be supplemented with additional training to enable the trainee to handle additional measurement methods or qualify to become an analytical service provider. Home inspectors who attend this course and pass the exam should be considered qualified to deploy and retrieve passive radon measurement devices, which will then be sent to a laboratory for the analysis, interpretation, and reporting of results.

The contents of the proposed course are outlined in Appendix 1. The heart of the course is a two hour section on test placement and conditions. One of the authors (S.S.) gave a trial version of this section to a continuing education seminar in April 1998, covering the subject with time for discussion and questions, in a 1.5 hour period.

Topics covered in the present Radon Measurement Operator course that are not included in this course are rarely-used methods and esoteric details and trivial facts to an inspector. For example, the proposed course introduces grab sampling as a concept, but does not discuss grab sampling methods in detail, since these methods may not be used for reporting purposes. This course does not cover the "mathematical" aspects of radon measurement, such as the calculation of equilibrium ratios, conversion of WL to pCi/L, calculation of WLM, dose conversions, details about the radon decay chain, relative percent difference, coefficient of variation, statistics and control charting for quality assurance. Detailed instructions on statistical quality control have been omitted from this course, as the analytical provider (laboratory) normally assumes this responsibility with passive methods.

CONCLUSION

We have proposed a concise, one-day introductory course that will provide sufficient training to permit accredited home inspectors to deploy and retrieve passive radon testing devices. It is our hope that such a course will attract home inspectors to become accredited radon testers. In our opinion, the availability of such a course and accreditation will elevate the quality and availability of radon testing services, especially in unregulated states. This will in turn lead to greater awareness of radon among home buyers, more widespread radon testing in real estate transactions, and accelerated identification and remediation of high-radon homes. Ultimately, we believe such a program will benefit the radon industry through increased demand for radon testing and mitigation services, and benefit the public through the reduction of lung cancer risk.

Table 1: New England home inspectors and radon testers - July, 1998.

	Unregulated States:			Regulated States:		
	MA	NH	VT	CT	RI	ME
Pop. (millions,1990)	6.0	1.1	0.6	3.3	1.0	1.2
Area (km2)	21,386	24,097	24,887	12,973	3,144	86,022
ASHI Inspectors	83	14	2	56	5	9
NAHI Inspectors	16	2	3	7	1	2
NIBI Inspectors	4	2	0	8	0	1
RPP-residential	11	6	1	35	18	6
RPP-analytical	3	5	1	12	2	6
AARST-individuals	29	12	2	17	10	4
AARST-companies	23	9	2	17	6	4

Sources: www.ashi.com, www.nahi.org, www.nibi.com, www.epa.gov, www.aarst.com
Note: RPP figures by state include only listings with business addresses within the state.

Appendix 1: Proposed radon testing curriculum for home inspectors

Radon Testing for Home Inspectors

One-Day Course

I. Basic concepts (1.0 h)

Radioactivity
Radiation - alpha, beta, gamma
Half-life
Inert gas
Uranium (mineral) > Radium (mineral) > Radon (gas) > Progeny (solids)
Radon progeny
Units: pCi/l, WL, Bq/m^3
Typical concentrations indoor/outdoor
Action level
Gas transport: diffusion, permeation, mixing/dilution, dissolution/aeration
Sources: soil, rock, building materials, water
Radon entry into house

II. Health effects (1.0 h)

Gas > progeny > (attachment) > lungs > alpha radiation > lung cancer risk
Dose-response model
Evidence of radon link to lung cancer (miner studies)
Residential studies
Extrapolating mines to homes
Radon-in-water > aeration > inhalation > lungs > known risk
Radon-in-water > ingestion > stomach/intestines/bloodstream > risk(?)
Synergistic effect with smoking
Risk at EPA action level
What level is "safe"?
Comparative risks: auto accidents, drowning, other radiation exposures, etc.

III. Radon test methods (1.0 h)

Test purposes: screening, follow-up/confirm, diagnostic, post-mitigation, maintenance, research/other
Duration: long term, short term, grab
Strategy: passive, active
Integrating vs. continuous
Screening protocol goals
Devices
ST Passive: AC, LS, ES
LT Passive: AT, EL
Active: CR, CW

IV. Test placement and conditions (2.0 h)

Variation: diurnal, seasonal, spatial, weather-related, occupant-related
Placement: level, room, location, how many
Minimum distances
Closed house
When required? When recommended?
Requirements for closed house
Notifying occupants
Interference/tampering: detecting, avoiding
Test invalidation
Data reported to lab with test kit
Interpretation of results
Measurement error /uncertainty
Large buildings, schools
Discussion
(Optional) Radon-in-water sampling

V. Mitigation (0.5 h)

Sub-slab depressurization: basics, typical costs, pitfalls
Other strategies: sealing, ventilation, whole-house press., crawl space press./depress., sub-membrane depress., water aeration, water GAC filtration
Comparative costs, problems
Radon resistant construction
Post-mitigation testing, system monitoring, and maintenance

VI. Relation with Client (1.0 h)

Dialogue with client
Risk communication
Confidentiality
Interpretation of results
What follow-up is required?
Real estate transaction
Re-test when?
Who pays for mitigation?
Negotiation and escrow possibilities
Discussion

VII. Relation with Laboratory (0.5 h)

Choosing lab
Levels of service
Division of responsibilities
Quality assurance responsibilities
Quality assurance plan

VIII. Role of Government (0.75 h)

Federal: EPA
States: unregulated and regulated
Regional review of state laws
Real estate disclosure laws
Radon Proficiency Program (RPP)
Radon outreach programs
EPA Publications: Citizens' Guide, Real Estate, Mitigation, Tech. Guidance

IX. Options for further training, credentials, and continuing education (0.25 h)

Advanced measurement methods
Analytical services and quality assurance
Radon in water
Radon mitigation standards, and inspecting mitigation systems
Video courses
AARST programs