

# Radon Reporter



2009 Spring/Summer

American Association of Radon Scientists and Technologists

## 2009 Radon Symposium “Gateway to the Future”

19<sup>th</sup> Annual International  
Radon Symposium



Union Station Marriott • St. Louis  
September 20 - 23, 2009

**Change Radon Laws:  
Act Up Now On Radon!**

**Mitigator's Corner:  
Real Estate Transactions**

**Opinion: Lung Cancer  
Reduction Act**

**Radon in the Workplace**

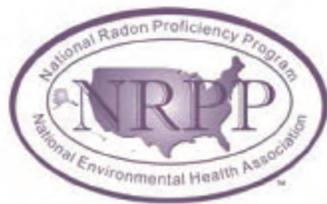
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AARST, the American Association of Radon Scientists & Technologists, is a nonprofit, professional organization dedicated to the highest standard of excellence and ethical performance of radon measurement, mitigation and transfer of information for the benefit of members, consumers, and the public at large. AARST's leadership is democratically elected by the members.

AARST represents your voice as we meet the wide range of challenges facing radon professionals and the community. Your membership and participation provides you a voice in the changes to come, and allows you to gain updated information, discover new techniques, learn about new problems before they occur, and hone your professional skills.

AARST has several local chapters where you can meet other radon professionals and state and federal officials who work with the radon industry.

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# From the President

## Great Challenges = Great Opportunities for Success

*By William J. Angell  
President, AARST*

**W**e need to support each other in our AARST family and the wider professional radon community in playing the different hands the economy has dealt us. That is part of the value we have as being members of this great team we call AARST.

It is also a critical time for each of us to step up to the plate of service and help tackle the challenges before us. There is no more important time for all good radon professionals to seize the moment to shape our collective future. There is no greater moment to be active in taking our profession forward against significant challenges.

What are some the critical challenges we face?

One of those challenges is giving support to help volunteer members of Cancer Survivors Against Radon ([www.CanSAR.org](http://www.CanSAR.org)) who are tackling the challenge of giving a voice and a face to lung cancer survivors and family members who want to speak out against the risk of radon. This is about helping Gloria, Liz, Barb, Marlene, and others speak their passion about the toxic dirty bombs that are in our nation's homes (borrowing the words from one of our colleagues).

Another critical opportunity is to be an active participant in the CanSAR-AARST capital and policy campaign intended to say to Congress, the President, and EPA leadership that it's time to restore funding for an effective Federal radon program. This is not a criticism of radon colleagues in the public sector, rather it is the demand that our country face the seriousness of the radon risk through resources and a mix of regulatory and nonregulatory state, tribal and federal programs.

It is also time to be prepared for debate about the trade-offs between short-term and long-term testing and prevention and

testing/mitigation. Let me be clear, I am a strong advocate for both short- and long-term testing as well as for both prevention and mitigations. I am also an outspoken advocate that testing, prevention, and mitigation must be done by certified and/or licensed professionals - - - who get a reasonable economic return for high quality work and the risk they undertake! We MUST also insist that EVERYONE who is performing radon measurements has clear documentation of quality assurance and quality control; no exceptions whether you are in the public or private sector!

We must also be ready to debate reducing the U.S. action level below 150 Bq/m<sup>3</sup> (4 pCi/L) to say 100 Bq/m<sup>3</sup> (2.7 pCi/L) and to advocate that the goal for new homes should be as low as half of the new action.

How do we prepare for debate about the action level, a national goal for new homes, and the balance between short- and long-term testing and prevention and mitigation? The short answer is come to St. Louis for the 20th International Radon Symposium, September 20–23, 2009. Yes, this is serious business but we have the annual opportunity to also share fun in St. Louis and beyond.

It is also the time for all who are leaders in our radon professional community to come to the table to participate in a common commitment to strengthen measurement standards and protocols. It is also time for those who ask for opinions from AARST to be forthright in communicating what, if anything, may have been done with these opinions.

Thank you for the honor to work with you on radon risk reduction.

*Bill Angell*

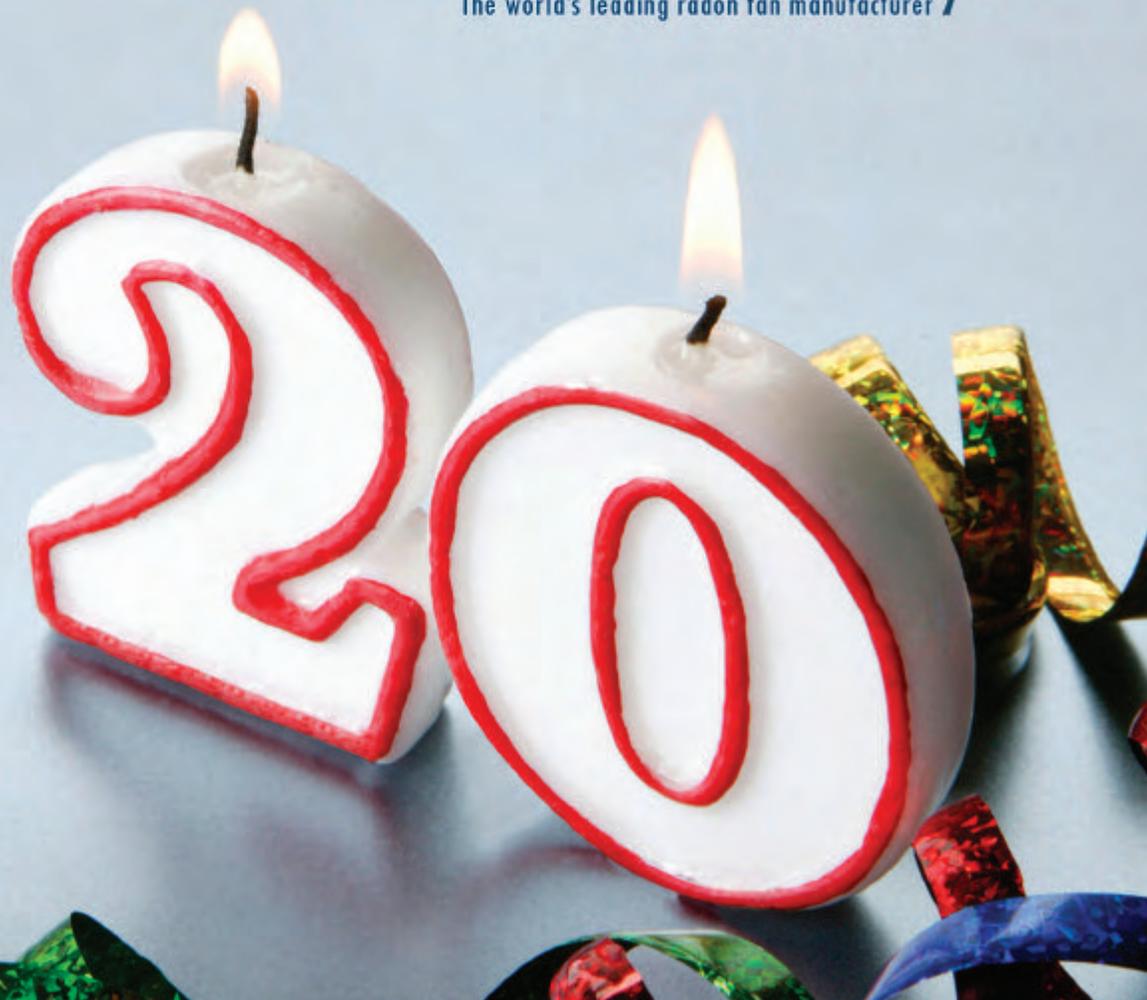


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# Act Up Now On Radon!

## AARST and CanSAR Advocate Change for U.S. Radon Laws and Program

By Peter Hendrick, AARST Executive Director

### **AARST members and all radon professionals MUST get involved NOW. Act Up Now On Radon!**

Go to: [www.aarst.org/ARPC/](http://www.aarst.org/ARPC/) and click on the Act Up Now On Radon Campaign link to express your views to your U.S. Representative and US Senators. Also, please consider supporting the effort through a contribution, as all of the AARST and CanSAR members working on this are volunteers.

Why am I asking you, pleading with you to act up now?

Because quite simply the mandate that USEPA received in 1988 from the U.S. Congress to lower indoor radon levels to levels equivalent to outdoor ambient air has been all but abandoned.

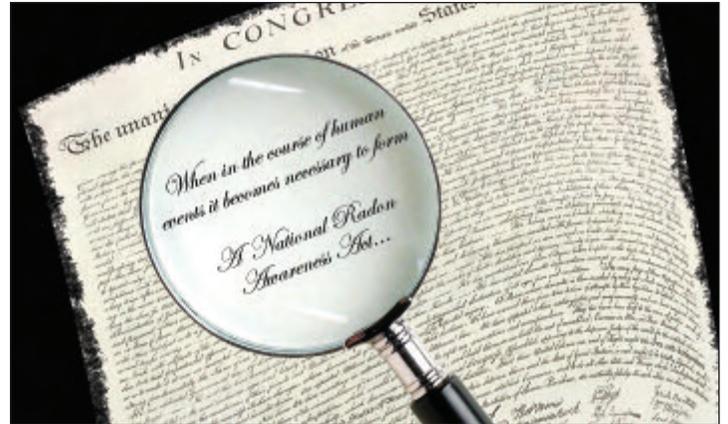
It's time to state a simple truth, as radon risk has increased in the U.S. and worldwide, USEPA radon policies and programs have failed to adequately protect the American homeowner. It is time for change. It is time to abandon a grossly underfunded voluntary approach toward radon risk reduction because it has failed to reverse the growing exposure of U.S. families to radon.

Consider this inventory of facts: Based on government statistics (that are hard to verify), the agency claims we have saved on average some 250 additional lives per year since 1998. Yet, in the twenty plus years that have passed since 1988, over 500,000 Americans may have died from lung cancer exposure in homes. Too many homes remain unsafe and unhealthy and this unacceptable.

If that math does not impress you, consider this:

We have more homes now with high radon levels that we did when we started in 1988. We build homes with high radon at a faster rate than we fix them.

In the United States, many successful environmental health programs have been created through regulation of the actual pollutant. Surely, this simple approach is the highest and best form of consumer protection. The resultant stimulus of such regulation has created extremely effective environmental-economic infrastructures for clean water and clean air programs that work – and they work well, creating technology, jobs and solutions, even entire service sectors



that have become vibrant and responsive to challenging technologic and regulatory environments.

The opposite has been the case with radon and its voluntary approach. As a result, we have been trying to create infrastructure that lacks sustainability.

The American Association of Radon Scientists and Cancer Survivors Against Radon (CanSAR [www.cansar.org](http://www.cansar.org)), working together as the American Radon Policy Coalition, are seeking changes to this approach.

We are proposing that the United States Congress begin to address radon in a manner that will stimulate real radon risk reduction.

Since January, both organizations have been working to introduce the National Radon Awareness Act of 2009. This bill will be based on the Illinois Radon Awareness Act of 2008. Unlike disclosure requirements that focus on the seller, the Illinois law focuses on informing the buyer of radon risk in a given area and allowing them to make an informed choice about their need for a radon test.

We've taken the Illinois Radon Awareness Act one step further. AARST and CanSAR are advocating that the National Radon Awareness Act also include:

- 1) Require testing for all federal mortgages in USEPA Radon Zone 1, and;
- 2) Require Notification of radon risk, using EPA material, in Zones 2 and 3.

# Act Up Now! On Radon!

Continued from page 4

Key point excerpted from ARPC's proposed legislation:

## Section 4. Radon testing and disclosure.

The Administrator with the Secretary of Housing and Urban Development shall within 1 year from the enactment of this legislation promulgate notice to all "Direct Federal financial assistance programs" that, except as excluded by this Act, they shall a) require a radon test prior to sale for all such mortgages located in U.S. Environmental Protection Agency radon Zone 1, and b) for radon Zones 2 and 3, provide to the buyer of any interest in residential real property the USEPA entitled document "Homebuyers and Sellers Guide to Radon" (or an equivalent state pamphlet approved for use by the USEPA) and the National Disclosure of Information on Radon Hazards, which is set forth in Subparagraph (b) of this Section, stating that the property may present the potential for exposure to radioactive radon before the buyer is obligated under any contract to purchase residential real property. The following shall be the form of Disclosure of Information on Radon Hazards to be provided to a buyer of residential real property as

required by this Section:

Go to: [www.aarst.org](http://www.aarst.org) home page for a PDF copy of the complete proposed legislation (and the Disclosure statement) – or contact [director@aarst.org](mailto:director@aarst.org) for a copy.

In addition to this bill, AARST and CanSAR advocates are working with Congressional staffers on seeking additional funding and resources for the USEPA radon program, including grants to States and tribes; additional funding and resources for research and development; funds for low income housing testing and mitigation; and we are seeking incentives, such as tax credits that would encourage testing and mitigation.

AARST members and all radon professionals need to get involved. Act Up Now on Radon!

Go to: [www.aarst.org/ARPC/](http://www.aarst.org/ARPC/) and click on the Act Up Now On Radon Campaign link to express your views to your U.S. Representative and US Senators. Also, please consider supporting the effort through a contribution, as all of the AARST and CanSAR members working on this are volunteers.

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# On the Road to Radon Policy Reform

with Gloria Linnertz



Gloria Linnertz with Illinois Governor Pat Quinn and Rep. Dan Reitz

April 23 was Lung Health Advocacy Day in my state capitol, Springfield, IL sponsored by the Respiratory Health Association of Metropolitan Chicago (RHAMC); and I was delighted to be invited to attend and involved again this year. Approximately 30 advocates shared their stories with our Illinois Representatives and Senators throughout that day and the previous evening during a dinner at the Governor's mansion. Our message to the legislators was generally a request for legislative action to improve the lung health of the citizens of Illinois with the support and sponsorship of specific bills. The organization and effort by RHAMC to arrange for this communication between the legislators and their constituents is invaluable!

Dan Reitz, my representative was the chief sponsor of the radon bills which were introduced in the House and passed successfully to the Senate. Radon bills before the senators include HB4223, HB1088 and HB2439 which address recommending schools to be tested for radon, requiring approval for radon testing devices by IEMA and establishing a task force to make recommendations for radon control methods in newly constructed homes. I had a few brief moments to share my husband's story with

Governor Pat Quinn, Senator Maggie Hunter and Senator Mark Maloney. My Senator, Dave Luechtefeld, is sponsoring HB4223, Senator Iris Martinez has taken over chief sponsorship of HB 2439 and Senator Jackie Collins is sponsoring HB1088.

I managed to drop by the offices of several senators to leave my card and a Cancer Survivors Against Radon brochure requesting support and sponsorship for the radon bills in the senate. My message is that approximately 25,000 people in the U.S. die of lung cancer each year from radon gas (1,200 in Illinois). This is preventable. The legislators have the opportunity to use their power to support bills that will help educate our citizens about this silent killer and to help save lives. Our citizens and our legislators are not aware of the deadly power of radon and it is up to us to teach them. We can win the war on lung cancer through PREVENTION! Radon gas can be prevented. Hopefully I will be able to meet with Governor Pat Quinn to seek further action against radon.

Gloria



Left: Gloria, a CanSAR and AARST Board member and advocate for radon policy reforms, receiving the Illinois Public Health Association's Volunteerism award

Right: EPA's Tracy Enger and American Lung Association's Angela Tam



# Register NOW for the 2009 Radon Symposium

## Symposium Links

Early Bird Symposium  
Registration

Hotel Registration

Symposium Program

Symposium Continuing  
Education Courses

Night Out Details

Fun Things to Do  
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Exhibitors Link

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## 2009 International Radon Symposium Gateway to the Future

September 20-23, 2009

# St. Louis



Meet us in St. Louis at the beautiful Union Station Marriott, a National Historic Landmark, for AARST's 19th Annual International Radon Symposium. Read more...



## Symposium Highlights

The 2009 Symposium will provide an opportunity to share ideas and to facilitate a worldwide exchange of information regarding radon in air, water and soils. AARST welcomes the participation of members of the scientific and medical community, radon testers, diagnosticians, mitigators, educators, public policy leaders and business leaders as well as consumers, both nationally and internationally. Read more...



## REGISTER ONLINE NOW AND SAVE \$\$\$!

To register in advance for the 2009 Radon Symposium and save money, go to [www.aarst.org](http://www.aarst.org) and make your selections and payments before August 1.

You can also register and prepay online for Sunday continuing education classes. All CE classes are described on the AARST website. Space for some classes is limited, so register early!

The preliminary symposium schedule is on pages 11 and 19 of this issue of *Radon Reporter*. Don't forget to check online at [aarst.org](http://aarst.org) periodically for symposium updates and schedule changes.

International Radon Symposium  
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On-Site Registration - \$455.00	On-Site Registration - \$455.00	On-Site Registration - \$480.00

Registration includes Sunday Welcome Reception, Monday and Tuesday Luncheons and Night Out. RSVP extra guests below.

\* Early bird special Payment must be received by AARST by August 1.

\*\* Payment must be received by AARST by September 1.

International Radon Symposium - Daily Rate for Members Monday 09/21/09 (Not including Night Out)	\$140.00 Quantity <input type="text" value="1"/> <a href="#">ADD to Cart</a> <a href="#">View Cart</a>
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# Mitigator's Corner

## Real Estate Transactions: Letting the Buyer Decide

*By Jay Bauder*

When I first got started in the radon mitigation industry, I quickly learned that there were two distinct markets. My favorite was homeowners. They were genuinely concerned about the health risks of radon exposure, and they were also concerned about how the finished product would look and perform. They were willing to pay for a quality mitigation system, and I was happy to have my name on it.



The second market, the one that I dreaded, was the Real Estate market. Most realtors didn't care about radon; they merely



viewed it as an obstacle to a sale. They were looking for 3 or 4 estimates, the cheapest fix they could find, and they wanted it done yesterday.

The one thing I did realize rather quickly was that it didn't take a lot of advertising dollars to reach Realtors, and they were a repeat source of business. The problem was how to get Realtors to call me back, if my price was consistently higher than my competition.

The solution I came up with works on the simple concept that with most real estate transactions, the home is the seller's old home, but the buyers dream home. So, I started to bid the system competitively, as a base price to the seller, and add "Buyer Upgrade Options" to let the buyers know that

there are differences in the way the system can be installed.

By far the most common Buyer Upgrade that I offer is routing the piping through the garage, locating the fan in the attic, and venting through the roof instead of hanging the system off the side of their home. Others can include a more aesthetically pleasing location of the system, having an external system better match the home, or installing a condensate pump on the air conditioner/furnace (many builders drain condensate under the slab).

The way that I sell it is by telling the listing agent that by offering it to the buyer, at the buyers expense, the buyer will feel included in the decision making process, and even if they decline the options, it will add to a spirit of cooperation at the settlement table. If the buyer isn't happy with the system design at final walk through, they have no one to blame but themselves. What I have found is that sales percentages increase because the buyers view you as a more caring company. Another thing I have found is that the top real estate agents have built their business on referrals and repeat clients. Those agents quickly see the value of this approach. A happy client is the least expensive, most effective advertising!



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# 19th International Radon Symposium

## Preliminary Schedule

Go to [www.aarst.org](http://www.aarst.org) for a detailed schedule, CE class information, and registration.

### Sunday, September 20

7:00 AM Granite Geology Field Trip Departs Hotel – *Details on p. 19*  
8:00 AM Morning CE Courses Begin – *Details at aarst.org*  
10:00 – 5:00 Symposium Registration Desk Open (Dixie/Flyer)  
9:00 – 4:00 Exhibit Hall Setup for Exhibitors and Poster Presentations  
10:00 National Radon Standard Consortium Executive Stakeholders Meeting  
1:00 Open Meeting Time  
3:30 AARST National Board Meeting  
5:30 AARST Election Supervisors Meeting  
6:30 – 8:30 Joint Reception with CRCPD

### Monday, September 21

8:00 – 8:15 Welcome – E-25 Radon Committee Chair Bill Bell; CRCPD Chairperson John Winston; AARST President Bill Angell; Regional Welcome  
8:15 – 9:00 Keynote on Radon Science-NCRP 160 (Why the Radon Message is More Important than Ever) – R. William (Bill) Field  
9:00 – 9:45 Keynote on Radon Policy – Terry Leach  
9:45- 9:55 Framing for Success – Tracy Enger, U.S. EPA  
9:55 – 10:25 Break / Exhibits / Posters  
10:25 – 11:00 Living Radon Reference Manual – Bob Lewis, Pennsylvania Department of Environmental Protection, and Paul Houle, University Educational Services  
11:00 – 12:00 Joint Industry, State and Federal Leadership Updates – Bill Angell, President, AARST; Mike Gilley, Chair-Elect, CRCPD, Bill Long, EPA  
12:00 – 1:30 Joint AARST and CRCPD Luncheon and Awards  
1:30 – 2:00 Other People's Money: Achieving Goals with New Partners – Andrew Gilbert, Minnesota Department of Health, and Jim McNeas, Alabama Department of Public Health  
2:00 – 2:35 Keep Your Phone Ringing: Drive Demand with New Partnerships – Peter Hendrick, Executive Director, AARST, and Kyle Hoylman, Protect Indoor Air Quality Services  
2:35 – 2:45 Applying Partnership Lessons – Tracy Enger, EPA  
2:45 – 3:15 Break / Exhibits / Posters  
3:15 – 3:45 Stakeholder Meeting Designs that Create New Radon Leaders – Sara Morgan, Nebraska Department of Health, and Angela Tan, American Lung Association of Illinois  
3:45 – 4:30 New and Existing Outreach Tools – Susie Shimek, EPA; Francesca Provenzano, Connecticut Department of Health; and William (Gene) Thomas, Wedco District (KY) Health Department  
4:30 – 5:00 Standards Updates – Trudy Smith (Multi-Family Measurement), Spruce Environmental; Bill Brodhead (ASTM 2121 Mitigation), WPB Enterprises; and Liz James (Home Measurement), Safe School Radon Testing Solutions  
5:00 Adjourn  
5:00 – 6:30 NEHA-NRPP Policy Advisory Board Meeting

### Tuesday, September 22

8:00 – 8:05 Announcements  
8:05 – 8:20 Welcome - Trudy Smith, Symposium Program Chair, and Bill Angell, AARST President  
8:20 – 9:00 An Update on Health Canada's Radon Program - Jeff Whyte, M.Sc., Head-Radon Technical Operations/chef-opérations techniques du radon Health Canada - Radiation Protection Bureau/Santé Canada - bureau de la radioprotection  
8:30 – 12:00 *Concurrent Sessions*  
8:30 – 10:00 Where's the Radon Really Coming From? – David Hill and Panel, 2 NEHA-NRPP CE Credits (no fee)  
*Plenary Session: Peer-Reviewed Research Papers*  
8:30 – 8:50 Tentative AARST Keynote Address  
8:55 – 9:15 Alpha Autoradiography of Thyroid Cancer Tissue - Benjamin A. Abrams and James F. Burkhart Physics Dept, Univ of Colorado at Colorado Springs  
9:20 – 10:00 Energy Losses and Operational Costs of Radon Mitigation Systems - L. Moorman, Ph.D. Radon Home Measurement and Mitigation, Inc.  
10:00 – 10:30 Break / Exhibits / Posters  
10:30 – 12:00 AARST Tools for Chapters - Peter Hendrick, AARST, and Angel Price, NEHA-NRPP, 2 NEHA-NRPP CE Credits (no fee)  
*Plenary Session: Peer-Reviewed Research Papers*  
10:30 – 10:50 TBD  
10:50 – 11:10 Why Radon Standards Are Important to Radon Professionals  
11:10 – 11:30 Detailed Radon Hazard Mapping, a Tool for Stimulating Radon Safe Building in Radon Prone Areas - André Poffijn, Federal Agency for Nuclear Control, Belgium  
11:30 – 12:00 Pre- and Post-Market Measurement of Gamma Radiation and Radon Emanation from a Large Sample of Decorative Granites – Daniel Steck, Ph.D., St. Johns University  
Noon – 1:30 AARST Annual Meeting and Luncheon  
1:30 – 3:00 *Concurrent Sessions*  
*Plenary Session: Peer-Reviewed Research Papers*  
1:30 – 3:00 AARST Chapter Round Tables - Local Leadership Development: Stepping Up Your Professional Profile through Local Partnering – Nicole Chazaud, AARST Chapter Coordinator, 1.5 NRPP-NRPP Continuing Education Credits (no fee)  
*Plenary Session: Peer-Reviewed Research Papers*  
1:30 – 1:50 Radioactive Granite: A Case Study & a Simple Test Method – Linda Kincaid, MPH, CIH  
1:55 – 2:15 Laboratory Intercomparison of Radon in Water Standards - Michael E. Kitto, Ph.D., NY DOH  
2:20 – 2:45 Radon Flux Monitor for In Situ Measurement of Granite and Concrete Surfaces - Paul Kotrappa and Fredrick Stieff, RadElec  
2:45 – 3:15 Break / Exhibits / Posters  
3:15 – 4:15 The State of the Granite Debate - Panel Presentation and Discussion - Trudy Smith, Panel Moderator  
4:15 – 4:55 Really Communicating Radon Risk: Cranking Up the Volume - AARST Panel Presentation and Discussion  
5:00 Adjourn  
6:30 – 10:00 An Alpha Particle Blues Night Out! BB's Jazz, Blues and Soups Club. Dinner buffet included.

*Continued on p. 19*

# Environmentally Friendly Monitors Unwanted Radon Gas



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# Opinion

## Lung Cancer Reduction Act Ignores Lung Cancer Prevention

by Linda Kincaid, MPH, CIH

Senator Diane Feinstein (D-CA) introduced the Lung Cancer Mortality Reduction Act of 2009 (S332). The bill proposes \$75 million, primarily for drug research. Radon is not mentioned in the bill.

While visiting Washington, D.C. in February, I met with Senator Feinstein's Legislative Assistant, Kristen Wikelius. I explained to Ms. Wikelius that radon is the leading cause of lung cancer in non-smokers. I pointed out that many new lung cancers are diagnosed in persons with no apparent risk factors. I reminded her that lung cancer treatment, expensive and debilitating, is rarely successful.

I requested that 10% of the funds in the bill be targeted for prevention. Dr. Bill Field estimates that reducing exposure to radon would prevent 10,000 lung cancers per year. The cost of radon testing and mitigation is much less than the cost of treating lung cancer. Dr. Daniel Steck has shown that Radon Resistant New Construction is the most cost-effective way to reduce radon exposure.

Senator Feinstein's aid indicated that S332 would not be revised to include radon. She indicated that the Senator's focus is on treatment, rather than prevention. She refused to arrange an appointment for me to discuss radon with the Senator.

Open Secrets showed me the reason Senator Feinstein supports cancer treatment. In her career, she has received \$1.4 million in contributions from the health sector. In 2000, she was among the top 20 senate recipients of donations from the pharmaceutical industry.

The pharmaceutical industry figures prominently in

Senator Feinstein's constituency. Pfizer, the country's largest pharmaceutical company, developed Sutent® at their \$552 million La Jolla Laboratories in Southern California. Sutent® is now in clinical trials for lung cancer treatment. Pfizer made \$1.6 million in political contributions last year.

Amgen, the world's largest biotech firm, is also based in Southern California. Motesanib, developed by Amgen, is now in clinical trials for lung cancer treatment. Amgen made \$1.3 million in political contributions last year.

S332 is similar to other bills introduced by Senator Feinstein over the past few years. This year, Senator Barbara Boxer (D-CA) joined as a co-sponsor. Senator Boxer has received \$1.1 million in contributions from the health sector during her career. In 2004, she was among the top 20 recipients of contributions from the pharmaceutical industry.

I submitted three requests to meet with Senator Boxer, including a request made in person when I was in the capitol. I also left an information packet on radon and lung cancer prevention with her staff. There has been no response from the Senator.

Since I met with Senator Feinstein's aid in February, a number of colleagues have emailed her with their concerns about S332 and its lack of attention to radon and lung cancer prevention. To my knowledge, Senator Feinstein has not responded to a single person that expressed those concerns.

As a resident of California, Senators Feinstein and Boxer are my elected representatives to the U.S. Senate. I was disappointed that political contributions speak more loudly than an opportunity to save lives and reduce health care costs. Perhaps our elected representatives will listen to the collective voices of radon professionals across the country. If they do not, we will have the opportunity express our disappointment in the next election.

S332 is currently before the HELP committee. In February, I delivered radon information packets to each of the senators on the committee. Please follow up with your elected representatives on the committee and let them know your concerns about radon and lung cancer.

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# RRNC Revisited

## Observations & Opinions

The following observations and opinions were written in response to a long and lively discussion on the pros and cons of RRNC.

### Passive Systems

By Tony McDonald, A-Z Radon Services

Just thought I would share with you a picture (above) of the passive radon system we were asked to activate last week. The builder claims this new setup is helping pass the radon test. It is just two pipes run from the outside footer drain to the surface. They wanted to know how much money they would save if we just attached one of our motors to it. We explained to them there was no guarantee it would work and they would be charged for two systems if we had to tear it out and start over. They decided to abandon these pipes and let the professionals install a nice interior unit.

Why do we distinguish between homeowners and builders? [Builders'] lobbying groups try really hard to make everyone think they own the home they are building so they can do whatever they want. Yet they have no more knowledge of radon reduction than the typical homeowner. Maybe we should just group them as one entity: homeowners.

### Emperor's New Clothes

By Rich Whisler, Accurate Radon

I am not as smart as many of you, nor do I have your responsibilities or credentials. I am just a mitigator in Chicago trying to do a good job, build a successful business, and reduce lung cancer deaths in my clients homes to the best of my ability. I install energy efficient, quality radon mitigation systems that deliver indoor radon levels as close to outside levels as possible. I am pretty good at it.

Normally I read the list postings and learn a lot from other people. The deluge of e-mails on the subject of RRNC and it's conversion into active systems tells me that there is room for my 2 cents. Yes, I am going to rock the boat a bit, but I think that before we add on to the compilation of decisions that have gotten us to where we are today, I think it appropriate to evaluate what we are doing now, and whether it is successfully reaching the congressional goal of indoor radon levels as close to outdoor radon levels as possible.

Let's just start with the fact that this whole issue is pretty close to the story about the emperor who had no clothes.

I might be the unknowing little boy who didn't believe the whole fantasy but here goes.

Let's start at the beginning with RRNC:

- It's not really radon resistant.
- It's not readily remediated.
- It is just a PVC pipe from under the basement floor to above the roof installed by untrained people, for unwilling builders, as cheap as possible, to sell a home to an unwitting consumer, who is told by the builder and through the endorsement of RRNC by the code officials, and state mandates, and the EPA, that somehow their home is now safe for their family.

#### The Unwitting Consumer:

- 1) Doesn't know that the pipe under the floor may be clogged up or stuck in the mud
- 2) Doesn't know that the passive system may be attached to the sump pit and thus produce inaccurate and inefficient vacuum pressured should the system be activated.
- 3) Doesn't know that the caulking not only is it probably the wrong caulking product but that it was done in a dirty house under construction and that it probably does not adhere properly to the concrete wall or floor.
- 4) Doesn't know that since radon codes don't require the protection of our systems from nails, screws, and mollies by placing them in a plumbing wall, there may be any number of leaks in their walls.
- 5) Doesn't know that the plumber's apprentice who put the pipe in didn't use the proper glue or primer on the system pipes since they were never trained to install a radon system's piping, and that at most he has been told it's just like a never pressurized vent stack.

**If the system is converted into an active system through the addition of a fan, then we add the following problems to the list:**

- 6) Doesn't know it's probably not properly engineered to create an efficient operating system.
- 7) Doesn't know that there may not be room in the attic for the fan upgrade.
- 8) Doesn't know the PVC pipe run in the walls may be pitched improperly to handle simultaneous upward airflow and downward water flow.

*Continued on p. 18*

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Robert K. Lewis is a Radiation Health Physicist with the Pennsylvania Department of Environmental Protection, Bureau of Radiation Protection.

# Radon in the Workplace

By Robert K. Lewis

I originally became interested in the OSHA Ionizing Radiation Regulations when I discovered some significant discrepancies in various literature sources regarding the Radon-222 exposure limit in the workplace. The primary reason for this discrepancy is that OSHA references Nuclear Regulatory Commission (NRC) regulations that are now 39 years old, and currently out of date. The below outline is a summary of these regulations as they still exist.

One of the most significant implications of these regulations on an employer is the stringent requirements that they inflict if they were to be enforced. I am not aware of any enforcement actions on an employer by an employee, concerning radon in the workplace. I am also not aware of how much radon testing has or is taking place in the work place environment. Schools would be one place where a fair amount of testing has taken place. I suspect that many schools that do find radon problems would correct the problem.

OSHA's primary mission is to provide for the safety of the American workers. OSHA regulations do not apply to the residential environment.

OSHA Ionizing Radiation Regulations: 29 CFR 1910.1096

Exposure Limit for Rn-222 in a restricted area: 100 pCi/L (this is the value found in the 1970, 10CFR20, Appendix B, Table 1, Column 1, for occupational exposure).

Exposure limit is based on average conc. for 40-hour week.

May be proportionally increased or decreased, depending on the 40-hour work week.

The employer shall perform surveys and measure the concentration of radioactive material present, where employees are exposed to said radioactive material.

Posting Requirements:

A room with concentration in excess of 100 pCi/L, or an occupied room with average conc. during occupancy > 25 pCi/L, shall be conspicuously posted, "Caution, Airborne Radioactivity Area"

Personnel monitoring equipment is required in restricted areas if the employee is likely to receive in any calendar quarter a whole body dose in excess of 0.31 rem (25% of the calendar quarter limit of 1.25 rem).

Personnel monitoring would also require that the employer maintain records of personnel radiation exposure.

Types of Areas:

Unrestricted Area: < 3 pCi/L

Where an employee continuously present would not receive in any one hour a dose in excess of 2 mrem or a dose in any seven consecutive days of greater than 100 mrem.

Where airborne radioactive material does not exceed the limits found in 10 CFR 20, Appendix B, Table 2, Column 1, 1970 for effluent releases). This value may be averaged over a period of not greater than one year.

Restricted Area: > 3 pCi/L.

Any area for which access is controlled by the employer for purposes of protection of individuals from exposure to radiation or radioactive materials 1910.1096(a)(3).

No individual in a restricted area may receive, in any period of one calendar quarter, a dose in excess of 1.25 rem to the whole body, head and trunk, active blood forming organs, lens of eyes, or gonads; 18.75 rem to the hands and forearms, or feet and ankles; 7.5 rem to the skin of the whole body 1910.1096(b)(1). These values may be exempted if during any calendar quarter the dose to the whole body does not exceed 3 rems; and the dose to the whole body, when added to the accumulated occupational dose to the whole body, shall not exceed 5(N-18) rems, where "N" is the individuals age in years. The employer must also maintain past and current exposure records 1910.1096(b)(2) (i,ii,iii). No one under 18 years of age may receive in one calendar quarter a dose in excess of 10% of the limits specified above (1.25, 18.75, and 7.5 rem) in a restricted area.

No employee shall be exposed to airborne radioactive material in an average concentration in excess of the limits specified in Table 1 of Appendix B to 10 CFR Part 20, in a restricted area. For radon-222 this is 100 pCi/L averaged over a 40 hour workweek 1910.1096(c)(1).

No one under 18 years of age may be exposed to airborne radioactive material in an average concentration in excess of the limits specified in Table II of Appendix B to 10 CFR part 20, in a restricted area 1910.1096(c)(2). For radon-222 this is 3 pCi/L averaged over a period not greater than one week.

An employee who enters a restricted area who receives or is likely to receive a dose in any calendar quarter in excess of 25% of the values specified above (1.25, 18.75, and 7.5 rem) shall wear personnel monitoring equipment for the purpose of measuring the dose received 1910.1096(d)(2)(i).

Radiation Area: > 5 mr/hr

High Radiation Area: > 100 mr/hr

Airborne Radioactive Area: >100 pCi/L or > 25 pCi/L (occupied area). This area shall be conspicuously posted, "Caution, Airborne Radioactivity Area."

# RRNC Revisited

Continued from page 15

- 9) Doesn't know that moving air in a pipe in a wall in the home can create a whooshing noise in the homes walls.
- 10) Doesn't know that the rubber roof flashing is designed to be pulled down over a plumbing stack once only, but that the radon fan installation and future fan changes will all involve pushing the PVC pipe both up and down through the rubber seal which may in fact cause leaking.
- 11) Doesn't know that current passive radon systems do not require a mold and mildew resistant insulation on all pipes that pass through non conditioned air spaces such as garages, exterior walls, and attics. Or that by adding a fan in the attic and thus lowering the PVC pipe temperatures, that in ten years or so of operation that the temperature differentials between the PVC pipes at soil temperatures and the hot humid non-conditioned attic/garage air may create condensation and mold in their homes. Please see the attached pictures if you are interested.
- 12) Doesn't know (and neither do most mitigators) that the fans also need to be properly insulated if installed in attics.

PROBLEMS 1-4: Can be addressed through more Rn testing and better education of the general public, homebuyers, and local code officials. RRNC standards could be simplified by eliminating the PVC pipe requirements entirely, and concentrating on an air permeable layer under every home.

Problems 5-11: Can be addressed by agreeing as an industry not to install fans on passive systems or in attics without proper pipe and fan insulation techniques. Let's just keep active and passive systems completely separate.

I know that still the boy on the side watching the parade but...

I think the emperor is naked!



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St. Francois Mountains



It is not too early to make plans to attend a very special event at the 2009 AARST Symposium in St. Louis. There will be a geology field trip on Sunday, September 20, 2009 lead by faculty from the Department of Geography-Geology at Illinois State University. This will be an all-day event with at least 4 major geological stops in St. Francois Mountains of southeastern Missouri.

The major focus of this trip will be visiting localities that expose many different kinds of granite, in the field, and learning how, when, why and what composes granite. The information and the opportunity to learn about granite is pertinent to the problems the radon industry is facing today. For example, The Missouri Red Quarry, where monument stone has been extracted for more than a century has excellent exposures of Graniteville Granite, which has a U-Pb of about 1.5 billion years. Other localities that we will visit include the Silver Mines Granite, Johnson Shut-Ins State Park, the Knob Lick Observation tower and old granite quarry, and Tiemann Shut-Ins.

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## Preliminary Schedule

Continued from page 11

### Wednesday, September 23

8:05 - 10:05 Advanced Mitigation Techniques:  
Troubleshooting Tough Homes – Panel - David Hill, Spruce Environmental, , 2 NEHA-NRPP-CE (no fee)

8:00- 8:05 *Housekeeping/Announcements – Plenary Session*

8:05 - 8:25 Uncertainties in the Evaluation of the Dose Coming from Radon in Tourist Caves - Carlos Sainz Fernández Department of Medical Physics, Radon Group, Faculty of Medicine, University of Cantabria

8:30 –8:50 Radon's Environmental-Economic Infrastructure - What America Needs to Get the Job Done

8:50 – 9:10 Radon's Emission in Ornamental Rocks - Gavioli, Y.S., Ilha da Cidade Universitária, Rio de Janeiro

9:10 – 9:40 Whole Building Ventilation of High Rise condominium with Elevated Radon from Concrete, William Brodhead, WPB Enterprises and Tom Hatton, Clean Vapor

# Symposium CE Field Trip Sunday, September 20

By Ruth Ann Lipic, Director of Radon Awareness Program at Illinois State University

Radon professionals are encouraged to bring their portable instruments to measure radiation emanating from the various rocks and locations. Illinois radon licensees have and enjoyed geology in the field with our faculty and it is my pleasure to bring this program to AARST. This will be in a comfortable bus which will leave directly from the hotel at 7AM and return by 6PM. For more details or if you have questions or concerns, contact Ruth Lipic at 309-438-5295 or email: rlipic@ilstu.edu.

The field trip has been approved for 8 Category I hours of continuing education from both IEMA and NEHA-NRPP. Dr. David Malone and Dr. Robert Nelson of ISU's Geography-Geology Department will be the guides and they know the area very, very well. They even wrote a booklet about it. Yes there is a fee - \$150.00 which includes lunch, snacks and the bus. We will have a comfortable tour bus for the whole day with sound and video equipment so that the professors can teach, talk and show geology videos. As with other symposium CE activities, registrations will be collected online at the AARST website ([www.aarst.org](http://www.aarst.org)). The CE will be issued by Illinois State University, Department of Health Sciences, Radon Awareness Program. Certificates will be given out during the conference.

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9:40 – 10:20 A Living Radon Reference Manual - Robert K Lewis and Paul Houle, PhD

10:20-10:50 Break / Exhibits / Posters

10:30 – 10:50 Can Cat Litter be a Source for Indoor Radon - Michael E. Kitto, Ph.D., NY DOH

*Concurrent Session – 1.5 hrs CE Credit (No Fee)*

10:30 – 11:30 The Opportunities and Risks of RRNC - Attorney TBA

10:50 – 11:10 Cold Climate Mititations: A Canadian Perspective - Robert (Bob) Wood, Mr. Radon, Ontario, Canada

11:10 – 12:10 Factors Associated with Residential Radon Testing Intentions Among Kentucky Homeowners - Gwendolyn H. Rinker, PhD Candidate, Univ of Kentucky

12:10 – 1:15 Lunch on your own

Symposium attendees are invited to rejoin CRCPD's 18th National Radon Meeting



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