

American Association of Radon Scientists and Technologists, Inc.

Announcement – June 6, 2014

*Abstracts Currently Accepted For Presentations
at the
2014 International Radon Symposium
Charleston, SC
September 28 – October , 2014*

June 6, 2014 - The following twenty-six abstracts have been initially accepted for presentation by the peer review committee of the 2014 International Radon Symposium, to be held this year in Charleston, South Carolina September 28th – October 1, 2014. The Symposium reserves the right to accept additional abstracts for presentation, and to make changes to the program. An initial program has been published and delineate prospective speakers and presentation times.

All presentations and publication of subsequent papers are contingent upon the researchers acceptance and completion of the full requirements of the International Radon Symposium's Proceedings editorial committee.

Please check the International Radon Symposium web site for ongoing program updates as authors are scheduled for either a presentation or poster session:

www.internationalradonsymposium.org

**THE EFFECT OF RAIN AND HVAC SETTING
ON RADON LEVELS IN A HOME**

Pascal Acree

Riverwood International Charter School, Sandy Springs, GA, USA

Abstract

This study sought to determine the effect of environmental conditions on radon levels in a home. The two independent variables in the experiment were (1) whether or not it was raining and (2) whether the HVAC system on the main level of the home was set to “ON” for continuous ventilation or “AUTO” for forced air only to maintain temperature. A recently calibrated Radalink Aircat® radon detector was placed in an unfinished basement of a three story house that had recently recorded concentrations at exactly 4.0 pCi/l, the action threshold level. Based on the results it was concluded that an active ventilation system successfully reduces radon. For this particular house, it was also concluded that the presence of rain increases radon concentration levels. The absence of requirements for engineered ventilation in our residential building codes misses the opportunity to achieve safer levels. Accordingly, regulatory measures are recommended for new residential construction.

**DETERMINATION OF INDOOR AND SOIL RADON
CONCENTRATIONS IN AL MAFRAQ DISTRICT**

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Abstract

Indoor and soil radon concentration measurements were carried out in the district of Al Mafraq, Jordan. Al Mafraq district consists of the city of Al Mafraq city (administrative center of the district) and several towns and villages. Time-integrated passive radon dosimeters containing CR-39 detectors have been used to determine the level of radon for 11 different regions in this district. Indoor radon concentrations were found to vary from region to region ranged from a minimum value of 20.2 Bq.m⁻³ in the Al Mafraq city and a maximum value of 46.7 Bq.m⁻³ in Hosha village. Radon in soil was measured at a depth of 40 cm below the earth surface. The minimum concentration was recorded in Al Mofraq city (3.3 kBq.m⁻³), while the maximum value was in Hosha village (10.3 kBq.m⁻³). A positive correlation was obtained between indoor and soil radon concentrations.

**PUBLIC HEALTH POLICY FOR TESTING OF RADON
IN MONTANA SCHOOLS**

Veronica J. Champer, BSN, RN
Laura S. Larsson, PhD, MPH, RN

Abstract

Radon as a human carcinogen has been clearly documented and children are an especially vulnerable population due to biophysical characteristics and duration of exposure. An investigation is necessary to determine if health policies exist to protect school children from radon exposure. This study inventoried the states with regulations regarding school radon testing. Nine states, eight with high geographic risk, have school testing policies. A public health policy draft governing testing of radon in Montana schools was developed based on the best practices included in the nine states. The study authors recommend working with the state attorneys general and nursing organizations to adopt the policy. The implication of the policy inventory is that 28 high-radon states do not have policies in place to protect school children from radon. The need for well written policy is evident and as states consider public health initiatives, radon testing in schools should be included in that discussion.

**DILUTION IS THE SOLUTION? WORKER EXPOSURE AND RADON
MITIGATION CHALLENGES IN NON-RESIDENTIAL BUILDINGS**

Winnie Cheng
Regional Radiation Specialist, Health Canada

Abstract

Occupational exposure to radon and its progeny are common for workers in mines, oil refineries, fish hatcheries, etc. The Canadian Nuclear Safety Commission regulates radon in Canada's nuclear facilities such as uranium mines and mills. The Canada Labour Code regulates radon exposure in general workplaces under federal jurisdiction. However, jurisdiction over the exposure to "Naturally Occurring Radioactive Materials (NORM)" rests with each Canadian province and territory by adopting the Canadian NORM Guidelines. Workers whose occupation do not involve with NORM yet working in dwellings with high radon, may be comparable to the NORM "occupationally exposed workers" for risk management consideration, particularly for attendants in fish hatcheries. The common principle for radon mitigation of non-residential dwellings is "dilution being the solution to the problem," such as by improving ventilation. This paper discusses the challenges experienced and strategies involved with mitigating two non-residential buildings via adjustment of ventilation. The excess lung cancer risks were estimated for the two scenarios, which underscored the importance of radon measurement, mitigation and risk management in the workplace.

**RADON RISK AWARENESS AMONG UNIVERSITY EMPLOYEES OF
OBAFEMI AWOLowo UNIVERSITY, ILE-IFE,**

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Abstract

Radon is considered a significant contaminant that affects indoor air quality. However radon is only known to few people, and there is limited documented research on its health hazards in Nigeria. We therefore assessed the awareness of radon and its' health risk among employees of Obafemi Awolowo University Ile-Ife, Nigeria. Academic staffs from all the 13 faculties were recruited for the study. Based on the requisite sample size, a semi-structured questionnaire was administered to the staff of these faculties. Only 42% of respondents are aware of radon, among which 43.8% knew about radon health risk. There was a statistically significant association between level of knowledge and academic background ($p=0.02$) with 41% of staff with core science background having good knowledge compared to 19% and 12% of respondents from health science and social science background respectively. Poor awareness of radon and its health risk exist among University employee of OAU.



**INDOOR RADON CONCENTRATIONS AND LOCAL GEOLOGY: A
CASE STUDY FROM A UNIVERSITY CAMPUS OF NIGERIA**

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⁵*Department of Geology, Obafemi Awolowo University, Ile-Ife, Nigeria.*

Abstract

Based on the geological composition of the University Campus of Obafemi Awolowo University, Ile-Ife, data were collected from office buildings underlain by two different lithologic rock units. Passive radon detector device was used to measure radon levels in buildings erected on 2 subsoils (granite gneiss and grey gneiss) on which most academic buildings were erected. The mean concentration of radon-222 measured in office buildings

directly overlying the 2 different rock types were 1.05 pCi/l for granite gneiss and 0.99 pCi/l for the grey gneiss. Statistical t test ($\alpha=0.05$) results indicated that there was no significant difference in the mean of radon concentrations measured between the two lithologic rock units. However between the minimum and maximum radon concentration obtained from buildings on these two rock units, there exists a difference (Granite gneiss: 0.5-3.2 pCi/l ; Grey gneiss: 0.0-5.3 pCi/l). The radon concentrations were found to be within the reference levels of ICRP.

**SOLVING THE CONFLICT BETWEEN BASEMENT
WATERPROOFING BEST PRACTICE AND RADON MANAGEMENT
IN THE UNITED KINGDOM**

Martin Freeman

Chair of the UK Radon Association

Abstract

Cellar conversion and new basement creation is widespread in the UK where basement living and working is frequent. All basements are at risk of elevated radon levels regardless of geographic location. In 1999 a landmark Court ruling altered the approach to waterproofing, steering designers and contractors towards the use of internally fitted drained cavity drain membrane systems. Based on air-gap technology, these membrane systems are not appropriate for gas proofing; in part of continental Europe their use is specifically discouraged for that purpose. The author set about resolving the conflict between good waterproofing practice and radon gas management in basements, producing a successful solution.

The paper explores the background of UK basement use, the key points of the landmark judgment and subsequent code of practice for below ground waterproofing. This code of practice now requires radon to be considered in waterproofing design and implementation, but overlooks how this might be achieved. The paper describes the process that was developed to solve the dilemma and illustrates with case studies. Although construction practices and basement usage differ across the globe, the principles involved may have relevant applications internationally.

**RADON MITIGATION FINANCING EFFORTS FOR POVERTY LEVEL
RESIDENTS IN NORTH CAROLINA**

Phillip Ray Gibson

*NC Radon Program Coordinator, NC Radiation Protection Section, NC Division of Health
Service Regulation, NC Department of Health and Human Services*

Abstract

Radon mitigators have often reflected on the economic disparities related to promoting radon education among home owners in poverty. Over 16 percent of individuals in North Carolina meet the federal criteria for economic poverty. Home ownership in North Carolina is over 67 percent. And, approximately 60 percent of all newborns born in North Carolina receive Medicaid coverage. This presentation will discuss these and other variables that have led the NC Radon Program initiatives to facilitate grants and loans that assist North Carolinians in economic poverty with radon testing and mitigation.

**WHY CHARCOAL DEVICES MUST BE ANALYZED SOON AFTER
MEASUREMENT: UNCERTAINTY AND MINIMUM DETECTABLE
CONCENTRATION**

Phillip H. Jenkins, PhD, CHP
Bowser-Morner, Inc., Dayton, OH

Abstract

The value of a radon measurement is meaningless unless one knows two additional pieces of information about the measurement; the total uncertainty and the Minimum Detectable Concentration (MDC). These statistics are particularly important when making measurements with devices that capture radon and then are analyzed later; such as grab scintillation cells and charcoal devices. During the delay between sampling and analysis, the quantity of radon in the device constantly decreases due to its decay with a half-life of about 3.8 days. Using 4-inch charcoal canisters as an example, and using typical values of analysis parameters, it is shown that the total uncertainty and the MDC for the measurement both increase with time after the sampling period and can become greater than acceptable values. This illustrates the importance of analyzing these devices as quickly as possible after sampling.

**ALERT BUT DON'T ALARM: RADON RISK COMMUNICATION
STRATEGIES OF A UK MITIGATOR**

Rebecca Kench

propertECO Ltd

Abstract

Over 2000 people die from radon related lung cancer in the UK every year. Despite this, awareness of radon amongst the general public and understanding of the risks amongst property professionals remains low. Communication from official sources has failed to impact significantly upon awareness levels in the past. It has therefore fallen to commercial organisations to take action to raise awareness and understanding in a proactive manner. A number of approaches have been tailored to target specific audience sectors, including technical seminars for property professionals and creation of easy-to-understand cartoons for those searching for information on the internet. Care is taken in the language used to communicate risk to avoid accusations of scaremongering. The underlying philosophy that has been taken when developing risk communication campaigns is the need to alert individuals to the risks of radon but not to alarm them. This paper explores the channels used and discusses methods found to be most and least effective.

**INTRODUCTION AND CURRENT SITUATION OF
STUDY IN YONSEI UNIVERSITY THE NATURAL RADIOACTIVITY
ENVIRONMENTAL HEALTH CENTER IN SOUTH KOREA**

Minjun Kim, *Yonsei University The Natural Radioactivity Environmental Center, South Korea*
SeungYeon Cho, *Yonsei University The Natural Radioactivity Environmental Center, South Korea*
DoHyeon Kim, *Yonsei University The Natural Radioactivity Environmental Center, South Korea*
SeonHong Kim, *Yonsei University The Natural Radioactivity Environmental Center, South Korea*
SeungChan Choi, *Yonsei University The Natural Radioactivity Environmental Center, South Korea*
Hojun Jeon, *Yonsei University The Natural Radioactivity Environmental Center, South Korea*
DongWook Cha, *Yonsei University The Natural Radioactivity Environmental Center, South Korea*
GyeongMin Kang, *Yonsei University The Natural Radioactivity Environmental Center, South Korea*

Abstract

The Natural Radioactivity Environmental Health Center that only approved by Korea government has systematically performed monitoring research, education and public relation services about group 1 carcinogen Radon which caused lung cancer. We have tried some works. For example, Exposed path grasp and lung cancer patients administration targeting of citizen who lived in high Radon concentration area, network construction with Radon program from excellent cooperation research team in Korea and advanced country, establishment of national Radon management based to forge the specialized Radon program that Korea state, that is climate topographical construction type and setting database aside.

**SYSTEM FOR MEASUREMENT OF RADON IN NATURAL GAS
USING LUCAS CELLS**

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Abstract

A laboratory study on the measurement of radon (²²²Rn) in natural gas will be described. The study showed a ~7% increase in the measurement efficiency of alpha-scintillation (Lucas) cells filled with less-dense natural gas rather than regular air. A theoretical calculation comparing the atomic weight and density of air to that of natural gas suggests a 7% increase in the cell detection efficiency when measuring radon. A description of a system used to collect and measure radon in natural gas from a production well in New York State using alpha-scintillation cells will be provided. The radon level in natural gas collected near the hydraulically-fractured vertical well averaged ~50 pCi/L.

**GROSS ALPHA ACTIVITY IN WATER USING ELECTRET
DETECTORS**

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²*School of Public Health, State University of New York, Albany, NY 12203*

Abstract

A method is described to estimate the gross alpha-particle activity in water using electret-based detectors. Response of the electrets to gamma-ray and beta-particle activities was determined to be minimal in comparison to their discharge from exposure to alpha-emitting radionuclides. Electroplated disks containing alpha-particle emitting isotopes of U, Pu, Th, and Am were used to calibrate the method and produced an average discharge rate of 0.0145 V/hr-dpm. Application of this factor to the discharge of electrets exposed to planchets containing precipitates from evaporated water produced results in general agreement with the activities placed on the planchets and measured using gas-proportional detectors. This method is applicable as a screening tool for small companies, without the need for expensive laboratory equipment.

ATTENUATION OF THORON (Rn²²⁰) IN TYVEK^(R) MEMBRANES

Paul Kotrappa, Lorin Stieff and Frederick Stieff

Rad Elec Inc.

Abstract

Tyvek is a popular membrane used as a building wrap during construction, because of a unique property which allows water vapor to permeate without wetting the membrane itself. Radon (Rn²²²) and thoron (Rn²²⁰) both diffuse equally through a Tyvek membrane, but radon is not attenuated due to its relatively long half-life of 3.8 days. Thoron, with a half-life of 55.6 seconds, will partially decay while diffusing and therefore becomes attenuated. The current work determines the attenuation of thoron for varying thicknesses of Tyvek. A thorium-loaded gas mantle is used as the source of thoron. The 960-milliliter thoron EIC monitor is used to measure thoron concentration, while different thicknesses of membranes are introduced in the path of the thoron. A 1mm-thick and a 4mm-thick Tyvek membrane attenuated thoron approximately by 50% and 95% respectively; radon is not attenuated in either case. The results are useful in choosing the thickness of the Tyvek membrane needed to attenuate thoron by a desired factor.

**EXPERIENCES WITH DIFFERENT APPROACHES TO INVOLVE THE
CITIZEN AND THE BUILDING PROFESSIONAL IN RADON
PROTECTION**

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Abstract

In this work, different approaches to information and measurement campaigns conducted in Austria are presented with respect to their goal, methodology, cost and success.

Various information channels have been used like internet, local and regional press, local informative events, free illustrative brochures, etc. Regardless of methodology, it is apparent that continuous information through various channels is required to substantially increase public awareness of the radon problem.

Measurement campaigns were carried out in different ways through interviewers or members of the fire brigade yielding different response rates. Financial aid has been given by one federal state to citizens since 1997 with the objective of promoting radon measurements, mitigation and prevention in dwellings. However, the willingness of citizens to take action is generally low.

The Bavarian Radon-Network, which was established in 2012 by the Bavarian Environment Agency, aims to inform and connect interested citizens, building professionals, radon experts, scientists and technicians throughout regular meetings. The radon strategy in Bavaria also involves training courses for building experts. Having formerly been involved in the project management at the agency, my experience with it will be shared with the audience.

**AN IMPROVED METHOD FOR LONG TERM RADON
MEASUREMENTS: A PRACTICAL APPLICATION OF THE DIXON
CRITERION**

Michael LaFontaine, P. Phys.

Physics Solutions Inc.

Abstract

A method is proposed to improve the reliability of long-term radon measurements involving passive devices such as alpha track detectors or electret ion chambers. A key feature of the method is the deployment of three similar detectors in nominally the same physical location, such that they are subject to conditions of equivalent temporal, seasonal, and environmental conditions over the course of the measurement period. The three resulting radon concentration measurements are then analyzed using a statistical method specifically designed for maintaining precision in small data sets (between 3 and 10 results), while providing a statistical basis for the rejection of an individual “outlier” or suspect result - this method is referred to as the Dixon Criterion.

This paper will discuss the initial application of the method during extensive site gamma monitoring performed at Chalk River Laboratories over the first six months of 2013, using 21 sets of three E-PERM L-chambers (within an aluminum canister) per calendar quarter. Results of a long-term radon measurement, performed using three E-PERM SLT-chambers mounted on a motorized turntable, will also be presented. Reference standards/guidelines, test protocols, and equipment will be discussed as will data analysis (including RMS errors).

**COMBINING TOBACCO CESSATION AND RADON TESTING: A
MULTI-AGENCY COLLABORATION TO PROMOTE THE HEALTH
OF MONTANANS**

Laura S. Larsson, PhD, MPH, RN

Abstract

Exposure to indoor radon and tobacco smoke have a synergistic effect meaning that the combined risk for lung cancer is more than additive. In a rural, high-radon geographic state, this concern led to a coalition approach to encouraging radon testing in Montana residents. A one-page radon background and risk document was included in the orientation packets for “Quit Line” enrollees attempting to quit smoking cigarettes. Free radon kits were sent to interested individuals. Data collection began January 1, 2014 and will end May 15, 2014. Results will be reported on the rate for accepting the invitation, the rate for completing the mailed test kit, and indoor radon concentrations for participants. A discussion of the role of the six agencies involved in the coalition and steps for other high-risk states wishing to launch a similar collaboration will be shared.

IMPROVED HEALTHY HOUSING THROUGH PUBLIC POLICY

Gloria Linnertz

Abstract

In December 2005, an oncologist informed my husband and me that radon is a known cause of lung cancer as he gave the diagnosis of Stage IV lung cancer to my husband. Six weeks after his diagnosis, Joe died. We had been living with over 4 times the EPA action level of radon for 18 years. Determination overtook my grief, devastation, and anger as I gathered statistics, data, and scientific studies to present to my Illinois (IL) representative with a proposal for mandated radon testing at the point of sale and if the level was 4.0 or higher, required mitigation before occupancy. Immediately, my representative filed a resolution to urge everyone to test for radon, schools to test, and financial institutions to offer low interest loans for mitigation. I communicated with all of the IL legislators informing them of the danger of living with high levels of radioactive radon gas and sent them my proposal with the 2006 Illinois Radon Status Report. Dallas Jones, an AARST board member, formulated the language, and the bill filed was the Radon Awareness Act passing the House and Senate unanimously. Homeowners testing their home at the point of sale have increased from 8% to 40% according to IL Emergency Management Agency.

Since 2006, 44 radon bills and resolutions have been passed in the U.S. Conclusion: individual and personal connection is what changes our world for improved healthy housing.

**EVALUATION OF RADON TESTING RECOMMENDATIONS FOR
MULTI-FAMILY HOUSING**

Antonio Neri ¹
Kyle Hoylman ²
Shawn Price ³

¹*Centers for Disease Control and Prevention, NCCDPHHP/DCPC/CCCB*

²*Protect Environmental Inc.*

³*American Academy of Radon Scientists and Technologists*

Abstract

An approach used to develop the lead-based paint sampling guidance for radon testing of multi-family housing may help evaluate percentage-based testing recommendations in finding ≥ 1 unit with radon ≥ 4.0 pCi/L in multi-family homes.

Probabilities were calculated for properties with 20–100 units when sampling 10%–100% of available units. Comparisons were made between a prevalence of 1:15 homes with radon ≥ 4.0 pCi/L vs. 1:3 homes. The probability of identifying at ≥ 1 unit ≥ 4.0 pCi/L when testing 10% of all units was between 28% for 40-units to 53% for 100-units. Where 1:3 homes were ≥ 4.0 pCi/L the probability of identifying ≥ 1 unit ≥ 4.0 pCi/L when testing 10% of units was between 84% for 40-units to 99% for 100-units.

This variation indicates a need for clarity in testing recommendations for multi-family housing. This information will help radon professionals, decision-makers, and public health practitioners make informed decisions about radon testing protocols.

**NATIONAL AND LOCAL PERSPECTIVES ON
RADON RESISTANT NEW CONSTRUCTION POLICIES**

Allison K. Nesseth, SN
Laura S. Larsson, PhD, MPH, RN

Abstract

The primary study aims were to conduct a national inventory of radon resistant new construction (RRNC) policies, test the association between geographic risk and policy adoption, and survey local building industry members to learn their perspectives on RRNC policy. Comparison and contrast of existing policies revealed a heterogeneous approach to RRNC. An odds ratio analysis was conducted to test if RRNC adoption was associated with high EPA zone designation. States with more radon risk were five times more likely to have implemented RRNC ($\chi^2 = 2.34$, OR = 5.00, 95% CI 1.2 - 19.3, $p < .05$). Local industry members reported 100% of projects included radon system installation at least occasionally despite the lack of RRNC policy in Montana. Given the heterogeneous nature of RRNC policies, the authors recommend including building industry members' perspectives as partners in drafting future policy.

**ENGAGING ONCOLOGY NURSES IN A PRIMARY PREVENTION
PROJECT RELATED TO RADON EXPOSURE: OUTCOME ANALYSIS
AND IMPLICATIONS FOR PRACTICE**

Maureen H. Quick, DNP, RN, OCN
Doctor of Nursing Practice System Change Project

*St. Catherine University
St. Paul, Minnesota*

Abstract

The position statement of the Oncology Nursing Society supports the role of oncology nursing to educate and facilitate integration of cancer prevention in clinical practice (ONS, 2007). The Radon Education Project (REP) had two aims. First, to increase oncology nurses knowledge of the association between radon exposure and lung cancer through an educational program as evaluated by an online survey. Second, to identify how primary prevention strategies related to radon exposure can be incorporated into clinical practice as recommended by participants in follow up focus groups. The final output was the development of a white paper as a guide for oncology nurses in clinical practice. This is the first documented initiative where oncology nurses have partnered with a state department of health in a formalized, programmatic approach to radon education. Oncology nurses were able to identify programmatic and prescriptive strategies for incorporating primary prevention education on radon into clinical practice.



**Measurement of Radon Concentration Gradient Within Hollow Type
Construction Masonry Units**

Satoh, Gordon T.
Environmental, Inc. – Commercial Division
Lansing, Michigan, USA

Abstract

Short term radon measurements were conducted within hollow spaces of basement walls built of unfilled construction masonry units (CMU). A Corentium, AS digital electronic radon monitor was used to conduct measurements via alpha particle detection on a silicon photodiode. Measurements at elevations were conducted for a period of seven days permitting instrument ramp up and measurement duration sufficient to attain 10% uncertainty. Replicates were conducted to provide multiple data points. Measurement of radon concentrations indicated a gradient of radon concentration ranging from 42.0 pCi/L to 10.7 pCi/L, grade to top.

Two methods of addressing radon pathways were compared: Diphenylmethane Diisocyanate foam (Dow Chemical Great Stuff Big Gap Filler) introduced through penetrations of a base CMU and Owens Corning Foamular 150 R-5 Insulation Board affixed to the top CMU with Loctite PL Advanced Polyurethane Construction Adhesive. Data were inconclusive, however they trended towards the insulation board method providing preferential results. These data could serve as the basis for confirmatory studies and development of radon mitigation methods through localized mitigation techniques. Confirmatory studies within multiple structures in different geographic regions are encouraged.

Abstracts Accepted For Presentations and/or Poster Sessions
2014 International Radon Symposium – Charleston, SC
**RECOMMENDATION FOR MORE DIRECT OBSERVATIONAL
(‘POSITIVE EPI’) METHODS TO ILLUSTRATE THE BENEFITS OF
REDUCING SOIL GAS EXPOSURES IN INDOOR AIR**

Henry J. Schuver, DrPH¹
Bazetta Blacklock-Schuver, RN²

¹USEPA, Washington, DC, ²National Institutes of Health, Bethesda, MD

Abstract

Traditional observational/epidemiological methods for environmental contaminants focus on identifying/isolating the deleterious effects of a single ‘additional’ presumed hazardous agent (e.g., radon & lung cancer). However, given that soil-gas is known to commonly contain more than one agent deleterious to indoor air quality and human health, and that removing these combined (soil-gas) intrusion exposures can be more rapidly and ethically implemented than ‘adding’ one, it could be more direct to document the health changes/benefits, if any, of removing/significantly-reducing soil-gas intrusion into indoor air in the same and/or similar populations through time. This will present a conceptual example of how a population with (and/or without) soil gas intrusion preventing controls could volunteer for health-benefits tracking to help illustrate the possible broad-scale (single and/or cumulative/multi-agent) associations with soil-gas exposures; and that could more convincingly demonstrate to the general public (raising societal awareness of) the benefits of keeping soil gas out of indoor air.

**CHOOSING THE RIGHT SIZE FAN: WHAT TO MEASURE AND HOW
TO CALCULATE**

Arthur Scott

Abstract

In a typical house, a 40 to 60 watt “radon fan” is enough to produce the needed sub-slab pressures to effectively prevent the flow of soil gas and radon into the house. However, in large buildings, or where the sub-slab fill is divided by footings or has high resistance to air movement, several suction points or a higher power fan may be needed. The measurements to be taken in the building are discussed, and an example is given to show how to design an effective SSD system.

Abstracts Accepted For Presentations and/or Poster Sessions
2014 International Radon Symposium – Charleston, SC
**RESIDENTIAL RADON EXPOSURE IN DWELLINGS OF
KATHMANDU VALLEY (NEPAL)**

Buddha R Shah and Dinesh Thapa

Physical Science Unit, Faculty of Science, Nepal Academy of Science and Technology

Abstract

The authors conducted a pilot study to understand the radon concentration in the selected dwellings of Kathmandu valley for the first time. The study covered more than 90 measurements in 42 dwellings in the valley, Nepal. The solid state nuclear track detectors were deployed to estimate the residential radon exposure. Two LR-115 Kodalpha dosimeters were installed in each dwelling one in the bed room and another in the kitchen for specified period of time.

The dependence of indoor radon levels in dwellings has shown a significant difference between the nature and type of dwellings. The radon level in one of the houses was found 787 Bq/m³. The mean annual inhalation dose rate due to radon in the dwellings of three districts comprising the valley is found 1.54, 0.96 and 1.59 mSv y⁻¹ respectively in Bhaktapur, Kathmandu and Lalitpur districts. The results will be discussed in more details.

**CURRENT INITIATIVES OF HEALTH CANADA'S NATIONAL
RADON PROGRAM**

Jeff Whyte and Deepti Bijlani

Radiation Protection Bureau, Health Canada

Abstract

This presentation will cover recent developments on both the technical and education and awareness components of the program.

A focus on the results from the recently completed residential thoron survey across 33 census metropolitan areas and an active soil depressurization system mitigation field study evaluating discharges near ground level will be discussed. The on-going progress with the Canadian General Standards Board for the development of two national radon mitigation standards (for new & existing construction) will be highlighted. Health Canada & the Canadian-National Radon Proficiency Program's collaborative initiative on the implementation of enhanced quality assurance measures for measurement professionals will be discussed. The initiation of a follow-up residential study on mitigation actions along with other current mitigation research will also be covered. Developments in education and awareness efforts include the launch of the second annual national radon action month and promotion of a new accredited continuing medical education course.