Canadian Radon Strategy and Action Plan

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Overview of the Presentation

- Background
- Cross jurisdictional roles and responsibilities
- Regulation of radon exposure to nuclear energy workers
- Regulation of radon in NORM industries
- National Radon Program
- Achievements and next steps
Background

- Evidence of lung cancer risk from large epidemiological studies
- Updated WHO and ICRP recommendations for risk assessment and management
- IAEA GSR Part 3, 2014
Roles and Responsibilities across Canadian Jurisdictions

• Canadian Nuclear Safety Commission (CNSC):
  – radon exposures of nuclear workers (i.e., uranium mines/mills)

• Canadian provinces and territories:
  – workers in NORM industries
  – public health and priorities for action

• Health Canada (HC):
  – National radon strategy
CNSC – Radon Exposure in Nuclear Workers (1)

• Regulation of uranium mines and mills falls under the jurisdiction of the CNSC

• Radiation protection requirements within *Radiation Protection Regulations (RPR)*

• Current RPR unique treatment of radon progeny (working level; working level month)
CNSC – Radon Exposure in Nuclear Workers (2)

- Proposed revisions to the RPR:
  - removal of direct reference to radon, radon progeny, working level, working level month
  - current calculation of radon progeny dose to be replaced with new proposed ICRP approach
  - separate consultation on any new dose coefficient
  - CNSC research projects
CNSC – Radon Exposure in Nuclear Workers (3)

• CNSC-funded study assessed:
  – effect of environmental factors on dose from radon progeny
  – whether the dosimetric approach is feasible at Canadian uranium mines

• Conclusions:
  – dosimetrically relevant data is limited
  – suitable commercial (off-the-shelf) equipment is not currently available
  – uncertainties associated with the implementation of a fully dosimetric approach
Provinces and Territories: Workers in NORM Industries (1)

- Canadian Guidelines for the Management of NORM (2013):
  - basic principle “same radiation protection standards as for CNSC regulated activities”

<table>
<thead>
<tr>
<th>Average Annual Concentration</th>
<th>NORM Program Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>800 – 3000 Bq/m³</td>
<td>Radiation Protection Management</td>
</tr>
<tr>
<td>200 – 800 Bq/m³</td>
<td>NORM Management</td>
</tr>
<tr>
<td>Background – 200 Bq/m³</td>
<td>Unrestricted</td>
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</table>
Provinces and Territories: Workers in NORM Industries (2)

- NORM Program Classification:
  - unrestricted – public dose less than 0.3 mSv/a and worker dose less than 1 mSv/a
  - NORM Management – public and worker doses exceed the 0.3 mSv/a investigation threshold
  - Radiation Protection Management – worker doses exceed 5 mSv/a (formal RP program)

*In comparison 200 Bq/m³ ~ 1.4 mSv/a (HC guideline)*
HC – National Radon Program (1)

• Established to support the implementation of the 2007 guideline of 200 Bq/m3

• Developed in collaboration with the Federal, Provincial, Territorial Radiation Protection Committee (FPTRPC)

• National Radon Program is a five component program launched in 2007
HC – National Radon Program (2)

• Five components of the program:
  1. Establishment of a national radon laboratory
  2. Radon testing projects
  3. Development and maintenance of a radon database and mapping of radon potential areas
  4. Radon research
  5. Development and implementation of a radon education and public awareness strategy
HC – National Radon Program (3)

• National Radon Laboratory:
  – Primary function – testing and analysis for HC; technical advice to provinces, territories and the public
  – Achievements:
    ▪ two technical guides (homes and public buildings)
    ▪ radon mitigation guidance document
    ▪ recommendations for revisions to the Canada Building Code
    ▪ Canadian certification Program for radon measurement and mitigation professionals and laboratories
    ▪ several large surveys including a cross-Canada residential survey (roughly 14,000 homes) and more than 15,000 Federal buildings tested
Percentage of homes exceeding 200 Bq/m3
HC - National Radon Program
Achievements (1)

- Two National Standards for Canada:
  - Radon Control Options for New Construction in Low Rise Residential Buildings - CAN/CGSB149.11
  - Radon Mitigation Options for Existing Low Rise Residential Buildings - CAN/CGSB149.12
Canadian National Radon Proficiency Program (C-NRPP) (launched in April 2012):

- 155 measurement certifications, 77 mitigation certifications, 11 Analytical laboratory certifications
- ~10 trainers providing C-NRPP approved courses
- C-NRPP adheres to Health Canada measurement/mitigation protocols. EPA/ASTM documents are referenced for QA practices or as necessary in mitigation practices.
HC National Radon Program – Research

- Field studies to assess efficiency of Active sub-slub depressurization (ASD) options
- Residential Mitigation Actions Follow-up study
- Refinement of lung cancer risk estimates
- Burden of lung cancer vs mitigation in homes with radon above guideline of 200 Bq/m3
- Mitigation research in conjunction with National Research Council partners
HC National Radon Program – Education and Public Awareness (1)

• Radon outreach in 2013:
  – 1st annual Radon Action Month
  – health promotion campaign with Dr. Roberta Bondar
  – accredited on-line continuing education (CME) course on radon for health care professionals
  – radon reduction guide for Canadian homeowners
  – radon outreach through Canada Post (Smartmoves)
  – “Distribution of Radon: Another Reason to Quit” fact sheet sent to doctors offices
  – events and conferences
• Radon outreach activities 2008-2014:

<table>
<thead>
<tr>
<th>Years</th>
<th>Outreach Events</th>
<th>Brochures Distributed</th>
<th>Public Inquiries</th>
<th>Web – Pages Views</th>
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<tr>
<td>2013/14</td>
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<td>1,038,000</td>
<td>790</td>
<td>122,000</td>
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HC National Radon Program – Education and Public Awareness (3)

• 2014 and beyond:
  – Continue to do outreach activities that are working:
    ▪ Post Canada Smartmoves program to new homeowners
    ▪ outreach to health care professionals – physician hotline and CME course
    ▪ Radon Action Month - November
    ▪ targeted outreach to ‘at risk’ populations (smokers, young families, high radon level regions)

  – Grassroots level approach:
    ▪ provinces / municipalities /health authorities
    ▪ health professionals
    ▪ industry – building / construction, real estate
Conclusions and Next Steps

• Federal, provincial and territorial programs and guidance are well aligned with WHO recommendations and IAEA BSS

• Implementation of ICRP proposed approach to radon dose calculation is being assessed. At the current low radon exposures in Canadian uranium mine workers this is not a high priority area and will require consultation with stakeholders
For More Information

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