Current Radon Research
as compiled from the Abstracts submitted to NRE-VII

ERRICCA-2 Kick-off Meeting
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Topics statistics on the 292 abstracts submitted to NRE-VII
(135 on Radon and Thoron)
Countries (42) statistics on the 292 abstracts submitted to NRE-VII
Countries statistics on the 135 abstracts on Radon (NRE-VII)
292 total /135 radon abstracts
Countries statistics:
All Topics vs Radon

- Radon research is still going on (~47% in NRE-VII abstracts)
- Most of the 42 countries are analogically involved in radon research as in other NRE fields
- This analogy is not followed - in favour of radon - in the cases of Germany and Japan and partly in the cases of Austria, Finland, Greece, Italy, UK and USA
Radon & Thoron NRE-VII
Topics (135 abstracts)

- Radon and Thoron metrology: 26%
- Radon Prevention and Remediation: 9%
- Radon surveys and mapping: 3%
- Radon modelling: 13%
- Retrospective Techniques: 2%
- Radon risk assessment: 15%
- Miscellaneous: 17%
- Radon thoron and the environment: 7%
Radon & Thoron RLE (ERRICCA-1) Topics (163 papers)

- Miscellaneous: 12%
- Radon and Thoron metrology: 7%
- Radon Prevention and Remediation: 8%
- Radon surveys and mapping: 6%
- Radon modelling: 14%
- Retrospective Techniques: 14%
- Radon risk assessment: 18%
- Radon thoron and the environment: 21%
Rn&Tn NRE-VII (135) vs RLE (162) topics

- **NRE-VII**
  - 21% Miscellaneous
  - 25% Radon and Thoron metrology
  - 13% Radon Prevention and Remediation
  - 15% Radon surveys and mapping
  - 14% Radon modelling
  - 7% Retrospective Techniques
  - 7% Radon risk assessment
  - 2% Radon thoron and the environment

- **RLE**
  - 14% Miscellaneous
  - 18% Radon and Thoron metrology
  - 12% Radon Prevention and Remediation
  - 7% Radon surveys and mapping
  - 8% Radon modelling
  - 7% Retrospective Techniques
  - 6% Radon risk assessment
  - 1% Radon thoron and the environment

- Reported work is increased on: **Metrology and Risk assessment**
- Reported work is decreased on: **Prevention and Remediation**
- Significantly less work is now reported on **Retrospective Techniques**
- Surprisingly, research on **Surveys and Mapping** seems to be going on at a constant rate
Important Areas of ERRICCA interest

1. Feasibility of developing a new non-destructive \textit{in situ} monitoring technique for concrete ageing using exhalation measurements

2. Improved method for measuring the radon diffusion coefficient of porous building materials (hollow cylinder geometry)
Important Areas of ERRICCA interest …

3. Study of Rn-222 exhalation of phosphogypsum blocks used as building materials

4. Results of the EU-CA for a survey on Radon Exhalation Measurements

5. A new recommendation guide for radon prevention in the design and construction of new buildings, in areas with highly elevated radon levels
Important Areas of ERRICCA interest …

6. Suppression of radon gas in security shelters
7. Developments in radon-safe building (with the installation of a bitumen felt)
8. A new method for supplying low radon air by using a hollow fiber module (development in cooperation with industry)
9. A new approach to increasing the uptake of radon remediation in the UK
Important Areas of ERRICCA interest …

10. Measurements and modelling of combined diffusive and advective radon transport in porous building materials
11. Cancer risks from radon in indoor air and drinking water
12. Radon-in-water secondary standard preparation
New Areas
Radon & Thoron Metrology

- Ra-226 measuring method by detecting alphas of Ra-226/Rn-222 in micro-precipitates by SSNTDs
- A method using an imaging plate (BAS-III developed by FUJI Ltd) for estimating the airborne concentration of radon progeny
- In-vivo (21 volunteers) measurements of deposition (respiratory tract and head ?) and absorption (blood analysis) of unattached radon progeny
New Areas

Radon Risk Assessment

- Prenatal exposure due to ingestion of radionuclides of natural origin
- Fetal dose from ingested maternal radon in water
- Biophysical mechanisms and radiation doses in radon therapy
New Areas
Radon Surveys and Mapping

- Some aspects of radon problem in Kazakhstan (dwellings up to 6 kBq/m³, soil gas up to 300 kBq/m³, 1000 dwellings tested with significant increase by 2.5 times of respiratory illnesses)
- Machine learning algorithms and geostatistics for mapping and classification
New Areas
Thoron

- Simultaneous measurement of radon and thoron exhalation rate from soil and BM
- Characterization of thoron and radon flow-through sources
- A new calibration facility for thoron gas activity concentrations
- Dose evaluation of indoor thoron progeny in some areas in China
Conclusions

- Radon research is going on
- Concerted Actions like ERRICCA-1 and RETRO... helped research on the topics: “Prevention and Remediation” & “Retrospective Techniques”
- The focusing on Metrology will help standardization and guidance
- Systematic investigation on radon should be extended to NIS countries