

ERRICCA 2
European Radon Research and Industry Collaboration Concerted Action
European Commission Contract N°: FIRI-CT-2001-20142



Management Report
July 2003 – December 2003

Prepared by:
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MANAGEMENT REPORT**CONTRACT NO :** FIRI-CT-2001-20142**PROJECT NO :****ACRONYM :** ERRICCA 2**TITLE :** European Radon Research and Industry Collaboration Concerted Action**PROJECT CO-ORDINATOR :** BRE**PARTNERS :**

NTUA, Greece
RISOE, Denmark
RPII, Ireland
NRPB, UK
Radon Council, UK
Hellenic Cement Research Center Ltd, Greece
Icopol Plastic Membranes a/s, Denmark
Remedia Limited, Ireland
FANC, Belgium
IBES, Belgium
University of Cantabria, Spain
CSN, Spain
STUK, Finland
Humi Consulting Oy, Finland
BFS, Germany
Tracerlab, Germany
Swedish Radiation Protection Inst., Sweden
Radon Prevent AB, Sweden
Swiss Federal Office Public Health, Switzerland
ISS, Italy
ARC Seibersdorf Research, Austria
OFI, Austria
CSTB, France
KVI, The Netherlands
ENCI, The Netherlands
DPRSN ITN, Portugal
Central Mining Institute, Poland
District Construction Inspectorate, Poland
Czech Tech University, Czech Republic
Radon vos, Czech Republic
University of Veszprem, Hungary
Inst of Occupational Safety, Slovenia
Interproject, Romania
HERO, Romania

REPORTING PERIOD : FROM: July 2003 TO: December 2003**PROJECT START DATE :** 01.01.02 **DURATION:** 36 MONTHS

Project funded by the European Community under
the Key action Nuclear Fission Programme (1998-
2002)

1	TECHNICAL OVERVIEW
1.1	Summary of the specific objectives
	<p>The key objectives for the fourth six months of this three year concerted action project were to:</p> <ul style="list-style-type: none"> • hold the fourth European Radon Forum Meeting. • Continue to organise National Radon Forum meetings • To extend progress with the five technical work packages • To further enhance and populate the ERRICCA 2 Website <p>Continue development of the project Technical Implementation Plan</p>
1.2	Overview of technical progress
	<p>Progress with work packages:</p> <p>W1 - ERRICCA Website – the website at www.european.radon.ntua.gr has been further developed and populated. We are still short of several national links and are applying pressure on those partners who have yet to provide the relevant information to the ERRICCA 2 Webmaster. We are still keen to have a link from the main European Commission website. This has been requested several times but so far without success. The ERRICCA website is being developed as the European radon website and as such it is important that it is linked to the EC website.</p> <p>W2 - Public awareness – The questionnaires completed by partners detailing public awareness raising activities in each country, their successes and failures have been reviewed and a summary report prepared. Again not all countries represented have responded but this largely reflects the maturity of the different radon programmes. Both the Summary and the questionnaires will be available on the website. A draft guide on buying and selling houses in radon affected areas has also been prepared and is currently being circulated for comment.</p> <p>W3 - Building Materials – Progress has been made in several areas although it has proven difficult to get partners to commit to putting their views down on paper. A sub-group has been established looking at testing of barrier materials a subject that was discussed at considerable length in the Copenhagen meeting.</p> <p>W4 - Newbuild Protection - The first draft of the report 'Pre- and post construction evaluation tools of radon protective measures' was completed using the input of the Questionnaire's. This draft report was extensively discussed and updated during the third and fourth ERRICCA meetings. Some debate on the final conclusions is still ongoing. Various opinions on the conclusions will be collected by means of a final Questionnaire (March 2004). The draft report will be made final after the fifth and last ERRICCA meeting.</p> <p>W5 - Radon Mitigation – most of the work associated with mitigation relates to the development of the database of case studies and generic solutions. Several countries have now supplied case studies and these are now being placed on the ERRICCA Website.</p> <p>W6 - Mapping and measurement – RPII undertook an evaluation of the questionnaire responses covering the position within partner countries with regard to :</p> <ul style="list-style-type: none"> • national recommendations/ requirements re measurement techniques and • approval, certification, validation and accreditation of radon measurement services. <p>Initial findings from 10 countries were presented in Copenhagen. Requested further input from those partners who have so far yet to reply.</p> <p>W7 - European Forum Meeting – Fourth European Radon Forum was held in Copenhagen between 10th -11th November 2003.</p> <p>W8 - National Forum Meetings – the second round of National Forum meetings have been organised during the year with meetings in Germany, Switzerland, Hungary, Finland, France, Ireland, Poland, Czech Republic and Netherlands held during this six month period. Attendances have been higher than last year, clearly demonstrating the highly effective approach that ERRICCA is bringing to raising radon awareness and disseminating information.</p>

1.3	Comparison of planned activities and actual work accomplished
<p>Most of the activities planned have been achieved and are running reasonably to schedule.</p> <p>The fourth European Radon Forum Meeting was held in Copenhagen between 10th -11th November 2003. The meeting was attended by 34 delegates representing 28 ERRICCA 2 partners. Minutes from the meeting have been distributed by BRE to partners and the European Commission Project Officer, and will be placed on the ERRICCA 2 website. The meeting again proved successful in progressing the various work packages and agreeing actions and outputs.</p> <p>Partners have been organising the second round of National Radon Forum meetings. Meetings have taken place in Germany, Switzerland, Hungary, Finland, France, Ireland, Poland, Czech Republic and Netherlands during this six month period. It should be remembered that when the 'Description of Work' for the project was drafted it was planned to aim for having run National Forum meetings by the end of May each year. However it was always anticipated that National requirements would mean that many events would need to take place later in the year.</p> <p>Good progress has been made with the five technical work packages although it a continual problem to get all partners to respond to the calls for information put out by the Topic Leaders.</p> <p>It would appear that most of the outputs promised under this contract will be realised, although not necessarily in quite the form first envisaged. For example there are three issues being considered for Topic 5 :</p> <ul style="list-style-type: none"> • Consideration of novel techniques, mitigation products, systems and equipment to reduce indoor radon from soil gas and building materials with particular emphasis on simple cost effective mitigation measures • Increased background knowledge of radon entry into buildings • Side effects of radon mitigation techniques <p>The outputs for these issues are likely to be amalgamated and will be published in the form of case studies.</p> <p>Whilst we are not making significant progress with increasing knowledge of radon entry mechanisms all of the other issues are effectively being addressed within the radon mitigation database.</p> <p>It was agreed with the EC Project Officer that although we had prepared a draft Technical Implementation Plan a TIP was really not appropriate for this project.</p>	
1.4	Planned activities for the next period
<p>Essentially the fifth six month period will see:</p> <ul style="list-style-type: none"> • Further development of the ERRICCA 2 website. • Further development of the five technical work packages. Much of this will involve the reporting of findings from questionnaires sent out during the earlier stages of the project. • Further promotion of the ERRICCA website and seeking further contributions for the various databases. • The third round of National Forum meetings will start to be held during this period. • Further development of National Radon Forum websites <p>• Note - there is no European Forum meeting taking place during the next six months – the final meeting is planned for September 2004 in the UK.</p>	
2	MANAGEMENT AND CO-ORDINATION ASPECTS

As mentioned previously the size of the group (35 partners) has increased the workload of the project and topic co-ordinators. Several partners have expressed concern at the protracted time it takes for payments from the Commission to reach partners. This year payments took about seven months to reach BRE for distribution. This resulted in at least two partners not being able to attend two meetings.

Generally the project is on schedule. Our only real concern at the moment is the future of the group and more importantly the future of the ERRICCA website which we believe provides the basis of a European Radon Website. It would be useful to arrange a meeting to discuss how the work of ERRICCA fits in with the Radon Network currently being developed by the EC.

SIX MONTH PROGRESS REPORTS FROM EACH PARTNER

Organisation Name: Building Research Establishment	Organisation No: 1
Report Period: 1 July – 31 st December 2003	

Report Prepared by: Chris Scivyer
Date: 27 th January 2004

Activities over the past six months

BRE have again been busy over the last six months with public awareness raising activities for radon in the UK. Most attention has been placed on activities in the South west of England the area with the highest concentration of affected buildings. As with the previous six months this has included running training seminars for members of the public, local authority staff, housing professionals, surveyors, solicitors, and builders. We have also assisted with visits to advise on remedial measures for existing buildings. New guidance has been drafted for people buying and selling of buildings in radon affected areas. BRE also run a telephone radon advice line which has dealt with some 900 - 1000 enquiries over the last six months. Although we receive no funding this includes providing advice and guidance on radon protective measures in support of the UK Building Regulations.

Chris Scivyer took Janos Somlai from Veszprem University in Hungary on a fact finding tour of UK radon remedial and newbuild protection works in the Southwest of England.

Meetings attended/arranged and any results from these

Swiss National Radon Forum

Chris Scivyer attended the Swiss National Radon Forum in Lucerne in November and gave a presentation outlining the work of ERRICCA2. The meeting was well organised and attended. It proved useful to be able

to meet various people from Switzerland, Germany, Denmark and the USA who attended.

Fourth European Radon Forum Meeting

BRE chaired the fourth ERRICCA 2 European Forum organised by Icopal and held at the Admiral Hotel in Copenhagen, Denmark 10th and 11th November 2003. The meeting was attended by 34 delegates representing 28 ERRICCA 2 partners. Minutes from the meeting have been distributed by BRE to partners and the European Commission Project Officer. The meeting once again proved highly successful in progressing the various work packages and agreeing actions and outputs.

Contributions made to work packages

BRE are work package leaders for work packages W2 and W5.

W1 ERRICCA 2 Website

BRE have contributed material for inclusion on the ERRICCA 2 Website, and are actively involved in the development of the site. This included the vetting of information placed on the website and chasing up partners for contributions.

W2 increasing public awareness and confidence

During this period BRE have issued a report outlining the experiences of ERRICCA partners in running radon awareness programmes across Europe. The report describes the findings of a questionnaire that was issued to partners earlier in the project. The aim was to identify the activities that have been tried and how effective they have been. Partners were asked to all the activities they may have been involved in or are aware of having been tried in their country - whether they proved successful or unsuccessful. Thoughts as to why particular activities worked well or failed were requested. It could be that local issues influenced what happened. Not all partners responded – largely reflecting the position at which they are with their national radon programmes. The information gathered is useful in identifying the activities which offer the greatest returns in terms of increased uptake of radon remediation.

W3 building materials

Chris Scivyer provided input prior to and during the meeting in Copenhagen to try to stimulate further activity towards drafting common guidance on regarding testing and certification of radon barrier materials.

W4 protecting new buildings

Limited activity in this topic since the start of the year..

W5 mitigation of existing buildings

Considerable progress has been made in developing a European database of radon mitigation measures. BRE have collated the case studies prepared by the various partners for inclusion on the European radon website. The intention is to compile a database of generic mitigation techniques that will be freely accessible via the ERRICCA website. For each technique a data sheet detailing specification information is being prepared, together with guidance on where and when each solution might be used, likely success rates and any limitations the solution may have. In addition a second database of radon remedial measure case studies accessible on the ERRICCA website has been initiated.

W6 mapping and measurement

BRE provided limited input to this topic through regular discussions with The work package leader.

Deliverables produced/Reports submitted

Preparation of the minutes for the fourth European Radon Forum meeting in Copenhagen
Fourth 6th Monthly Report for BRE
Further development of the UK National Radon Forum Website within BRE website. WWW.Bre.co.uk/radon
Preparation of Case studies for the European website
Preparation of report on radon public awareness raising activities in Europe.

Proposed work for the next six months

General co-ordination and project management. Preparation of the 4th Project Progress Report, preparation of BRE's Cost statement for period January –December 2003, and the collation and submission of partners cost statements to the Commission. Start to organise the 5th and final ERRICCA 2 European Radon Forum meeting and 3rd UK National Radon Forum. Initial development of guidance to assist buyers and sellers of buildings in radon affected areas as part of WP2. Further development of WP5 databases. Input to work on test protocols for radon barriers. Further development of ERRICCA Website and UK Radon Forum Website. Contribution to WP 4 protective measures for new buildings. Generally try to encourage partners to become more involved in work packages.

Any other observations or comments

To date BRE have found ERRICCA 2 to be a very useful forum with considerable progress being made in most areas. There has been considerable liaison between partners across the project and with interested partners outside the group. It is clear that the establishment of National Radon Fora has been an astounding success and should in future prove extremely useful in disseminating information on radon across Europe. Whilst the Fora have proven to be a success with all partners actively involved it is noticeable that the other work packages are not so well supported. It would appear to reflect that the topics cover a wide range of issues and yet our project partners are often only interested in quite narrow topics. It also reflects to a certain extent that some countries are more advanced than others, and of course project funding only covers travel and subsistence costs not practical work. Nevertheless progress is being made and there is quite a lot of interaction between partners outside meetings.

BRE were invited to attend the Italian National Radon Forum and purchased the necessary air ticket but the meeting was later cancelled. Due to increased co-ordination activities some of the BRE allocation of funds was transferred from travel and subsistence to staff.

Organisation Name: DPRSN – Instituto Tecnológico e Nuclear	Organisation No: 29
Report Period: 1 July 2003 - 31th December 2003	

Report Prepared by: Maria Conceição Faisca / Pedro Miguel Duarte

Date: 31 December 2003

Activities over the past six months

- Contribution to the national radon map through the analysis of new radon data values; some of the new data had contributed to clarify some areas without representative values;
- The reconstruction of the dwelling referred on the last six monthly report is now concluded. Radon measurements were performed during two different seasonal periods. We are still waiting for the last exposition values. After that we'll conclude about the efficiency of the radon protective actions;
- From all questionnaires obtained during our indoor radon national survey, the information was checked and kept in a digital data base form. Each individual value was crossed with geological background information using a Geographic Information System. A new and more representative radon map is still under construction.

Meetings attended/arranged and any results from these

Contributions made to work packages

W4 – Implementation of new and eventually final radon protection measures in a dwelling (in adaptation and reconstruction stage) situated in a granitic region.

W6 - A new and more representative radon map is under construction.

Geological polygons will replace old administrative polygons once they are more representative and statistically significant.

Deliverables produced/Reports submitted

Proposed work for the next six months

- To verify the effectiveness of the protective measures implemented in the studied dwelling;
- To test other materials / paintings that could act as radon barriers;
- Radon exhalation of building materials with emphasis on natural rocks;
- Conclusion of an indoor radon map based in geologic features, with a classification of risk areas;
- Conclusion of the national radon web site;
- 3rd National Radon Forum

Any other observations or comments

Organisation Name: Swiss Federal Office of Public Health (SFOPH)	Organisation No: MB16
Report Period: 1 July 2003 - 31th Decembre 2003	

Report Prepared by: Georges Piller
Date: 06.01.2004

<p>Activities over the past six months</p> <p>On 3./4. November 2003 a “National Forum 2003” in the framework of ERRICCA was organized in Luzern. About 80 persons from building industry, research and authorities attended to this forum which also included an exhibition. The program and transparencies of all presentations are available on www.ch-radon.ch.</p> <p>On 11./12. November 2003, the SFOPH participated with one person at to ERRICCA 2 meeting in Copenhagen.</p> <p>Work package W4: The questionnaires D7 (new buildings) and D8 (radon protective construction technique) have been filled out and sent back in December 2003. The enclosures to D8 are in progress and are expected for January 2004.</p>
<p>Meetings attended/arranged and any results from these</p> <p>ERRICCA 2 – Meeting of 11./12. November 2003 in Copenhagen, Danmark</p>
<p>Contributions made to work packages</p> <p>Work package W4, Deliverables D7 to D8 (excl. enclosures)</p>
<p>Deliverables produced/Reports submitted</p>

Proposed work for the next six months

Enclosures for W4/D8

Preparation of Information Day for the Cantons (23 March 2004)

Answer to queries of topic leaders

Any other observations or comments

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Organisation Name: University of Veszprém	Organisation No:28
Report Period: : 1 July 2003 - 30th December 2003	

Report Prepared by:János Somlai
Date: December, 2003

<p>Activities over the past six months</p> <p>Study of radon exemption methods in England Consultation with architects and medical experts. Building co-operation with authorities in order to create regulations in Hungary. Experiments on intervention methods in a model house.</p>
<p>Meetings attended/arranged and any results from these Arranged and attended:</p> <p>Organizing the ERRICA-2 National Meeting Contribution to organizing the conference “Environmental <i>damages</i> and the respiratory system”. Presentations: Five presentations about the environmental effects of radon, its measurement, prevention, posterior interventions and building materials Three presentations about the medical effects of radon and radon measurements. Three presentations about radon problems at workplaces and the effectiveness of sump system.</p>
<p>Contributions made to work packages</p> <p>Development and refinement of measurement methods at workplaces. Testing and developing radon exemption methods in special cases. Experiments on intervention methods in a model house.</p>
<p>Deliverables produced/Reports submitted</p> <p>8 proceedings of four conferences published about the radon problem and about the intervention methods.</p>

Proposed work for the next six months

Organisation and operation of a calibrating measurement with track detector in Hungary, in a radon-calibration chamber.

Exhalation test of radon deriving from building materials

Contacting local governments of radon-endangered areas in order to participate in a joint study and intervention project.

Any other observations or comments

Organisation Name: <i>ISTITUTO SUPERIORE DI SANITA'</i>	Organisation No: <i>MB 17</i>
Report Period: <i>1 July 2003 – 31st December 2003</i>	

Report Prepared by: <i>Serena Risica</i>
Date: <i>December 22nd, 2003</i>

Activities over the past six months
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Meetings attended/arranged and any results from these <i>Participation, as an observer, to the fourth ERRICA 2 meeting held in Copenhagen, November 10th and 11th, 2003</i>

Contributions made to work packages W1: ERRICA2 website <i>I wrote a text in English language about indoor radon, the contribution of building material to radon concentration indoor and gamma irradiation, and the EU legislation on these issues, for inclusion onto the website (general frame).</i> W2: Increasing public awareness and confidence <i>I examined and commented the draft document "Review of radon awareness activities in Europe".</i> W3: Radon Mitigation <i>With a personal approach and contact with colleagues I distributed the draft template,s to be used for generic radon mitigation and case study examples, prepared by BRE to the only (2 or 3) Italian laboratories with radon mitigation experience</i>
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Deliverables produced/Reports submitted**Proposed work for the next six months****W1: ERRICA2 website**

To prepare a page in Italian language for inclusion onto website (link to the eventual Italian site).

W3: Radon Mitigation

Collection of the draft templates to be used for generic radon mitigation and case study examples prepared by BRE and eventual preparation of a small document to present them

W8: National Forum Meeting

Organisation of a National Conference about ERRICA 2 and radon issues, with invited speaker the contract leader Chris Scivyer, to be held in 2004. It will be funded by the Istituto Superiore di Sanità.

Any other observations or comments

Organisation Name: Radiation and Nuclear Safety Authority - STUK	Organisation No: MB10
Report Period: 1 July - 31 December 2003	

Report Prepared by: Hannu Arvela

Date: 23.12.2003

Activities over the past six months

Meetings attended/arranged and any results from these

- **Participation in the ERRICCA 2 4th European Radon Forum, Copenhagen 10-11.11. 2003**
 - Oral presentation from STUK “Radon bee - new campaign in Finland”.
 - STUK started new co-operation in radon modelling (RISO, Denmark, Claus Andersen) aiming at better understanding of radon entry into Finnish residential houses.

Contributions made to work packages

W1 ERRICCA Website

- STUK has been designing the contents of the English pages on Natural Radiation Laboratory of the STUK-web site.

W2 Increasing public awareness

- National press releases and journal articles (radon measurement season started, new radon campaign started)
- Participation in the Health and Beauty 2003 Fair, Indoor Air compartment in co-operation with other organizations
- Radon bee - new campaign. Planning of a local radon campaign in co-operation with local authorities. The campaign started 15.10.2003 and resulted in 700 new radon measurements in an area where in the previous 15 years altogether 2100 measurements have been made.

- Regional radon forum , Lahti 5.11.2003
- Publication a new book of environmental radiation including an overview on indoor radon in Finland, STUK.

W3 Building materials

- STUK has continued a study aiming at updating the knowledge of radioactivity in building boards used in Finland

W4 Protecting new buildings

- A new national guidance for radon-safe building was published in February 2003 by Building Information Ltd. STUK has been designing a follow-up study on the implementation of the guidance.

W6 mapping and measurement

- STUK has added new data from 2000-2002 to the indoor radon data base used for mapping and research.

W8 National Radon Forum

- Second Regional Radon Forum, October 5th, Lahti
Expert seminar 60 participants, municipal authorities and industrial people
 - regional radon situation
 - radon mitigation
 - new guidance on radon safe building
 - radon mitigation
 - radon in household water

Citizens seminar took place in evening
advertised in press, radio and newspapers
30 people attended.

Topics were the same as for experts, with shorter presentations.

Feedback was good with plenty of discussion on health questions, measurements and mitigation. The Forum gave us insight as to what public feel is more important.

Deliverables produced/Reports submitted

- Publication a new book of environmental radiation including an overview on indoor radon in Finland, STUK.
- Vesterbacka P, Turtiainen T, Hämäläinen K, Salonen L and Arvela H.

Removal of radionuclides from household water. STUK-A197. Vantaa 2003. 94 pp. (In Finnish, abstract in English)

Proposed work for the next six months

W1 ERRICCA Website

- STUK will improve the English radon pages of the www.stuk.fi.

W2 Increasing public awareness

- National press releases and journal articles
- Training of radon mitigation in Hollola, in connection of the Radon bee campaign.

W4 Protecting new buildings

- Follow-up study on the implementation of the new guidance on radon-safe building.

W6 mapping and measurement

- STUK will improve and update the national and regional indoor radon maps

W8 National Forum

- Arrangement of the third regional Radon Forum, 2004.

Any other observations or comments

Organisation Name: HELLENIC CEMENT RESEARCH CENTER Ltd	Organisation No: MB3
Report Period: 1 July 2003 - 31th December 2003	

Report Prepared by: Ch.Malami
Date: 15/12/2003

Activities over the past six months
Meetings attended/arranged and any results from these 4 th European Radon Forum of ERRICCA 2, Kopenhagen-Denmark, 10 & 11-11-2003
Contributions made to work packages ⇒ Answering questionnaires of WP 8, 9, and of Topic Building Materials. ⇒ A short survey : THE “TEST SAMPLE” ACCORDING TO EUROPEAN AND INTERNATIONAL STANDARDS FOR BUILDING MATERIAS , given as contribution to the Scientific Partner (NTUA) for the corresponding WP.
Deliverables produced/Reports submitted
Proposed work for the next six months
Any other observations or comments

Organisation Name: CSTB	Organisation No: MB20
Report Period: 1st July 2003 – 31th December 2003	
Report Prepared by: Bernard Collignan	
Date: 15th December 2003	
Activities over the past six months	
<p>Attending at the fourth European forum in Copenhagen (10-11th November 2003).</p> <p>Preparation, organising and animating the first French national forum (20th November 2003 at Villeurbanne)</p>	
Meetings attended/arranged and any results from these	
<p>Preparation, organising and animating the first French national forum (20th November 2003 at Villeurbanne) :</p> <p>Around 80 people attending. 12 industrial stands during the forum.</p>	
Contributions made to work packages	
Answers to different questionnaires	
Deliverables produced/Reports submitted	
Proposed work for the next six months	
Organisation of the second national French forum planned for 11 th may 2004 at Rennes (Britanny)	
Any other observations or comments	

Organisation Name: Nuclear Safety Council (CSN)	Organisation No: 13
Report Period: 1 July 2003 - 15th December 2003	

Report Prepared by: J.L. Martin Matarranz ; E. Suarez Mahou

Date: 12th December 2003

Activities over the past six months.

- **Public Information and Communication**

Nuclear Safety Council (CSN) Information Centre.

During the June—30th November period, the information centre was visited by a number of 1810 students, who attend different schools and universities.

The centre, also, was visited by people from Spanish and overseas institutions from Austria, France and Mexico.

Exhibitions and scientific fairs participation .

CSN , participated in the Spanish science fair promoted by the Community of Madrid, " *The week of the science*", 3th edition that was held between 3th-16th November 2003.

During the fair , the days 3th, 4th, 12th and 13th were open-door days for visiting the CSN information centre. It was visited by 170 people.

Activities over the past six months.

Publications.

The article "*The protection against radon in the Spanish Technical Building Code*" was published in the DGSNR magazine Contrôle n° 153 June 2003.

The article "*Radon protection in the Technical Building Code*" was issued, in the CSN magazine n° 27. June 2003.

Cantabria University- CSN article "*Natural radiation exposure in the vicinity of Spanish nuclear power stations*" was published in Health

Physics Volume 85, Issue 5 November 2003.

A draft of the CSN publication "*Radon in Spanish houses and other studies of natural radiation*" was finished.

A chapter "*Radiological protection against natural radiation sources*" to be included in a future CSN publication, was completed.

Cantabria University- CSN article "*Natural gamma radiation map MARNA and indoor levels in Spain*", is going to be issued in *Environment International*, Volume 29 Issue 8, February 2004.

Technical Catalonia University-CSN article "*Traceability of ^{222}Rn activity concentration in the radon chamber at the Technical University of Catalonia (Spain)*" was sent to *Nuclear Instruments and Methods* magazine.

Other Activities.

CSN answered some questions about different aspects of natural radiation protection. During this period, the questions were done by the media (newspapers, radio), some industries and members of the public. Some radon measurements in dwellings have been done, with the Cantabria University collaboration.

Activities over the past six months.

• Research Projects Support.

During the last six-month period, the following research projects agreements, dealing with natural radiation protection, have been signed.

CSN-Cantabria University.

- *Workers exposure due to natural sources in some Spanish industries*
- *Radon concentration evaluation in buildings located in zones with different gamma radiation levels.*

CSN- Barcelona University.

- *Study of the risk associated with radon progeny inhalation in different workplaces and dwellings.*

CSN- Catalonia Technical University.

- *Study of the response of radon measurements systems in different environmental conditions of some workplaces.*

The following research projects dealing with radon have been presented to the CSN.

- Institute of Construction Sciences- Cantabria University project "*Study of the remedial actions effectiveness in existing buildings*"
- Santiago de Compostela University " *^{222}Rn and ^{226}Ra concentrations in drinking and spas water of Galicia Region*".

The Spanish Natural Radiation Map. (MARNA).

CSN has continued performing the fourth stage of the MARNA project. By means of this phase a country area of 86.000 km² is being covered. The Marna project is being developed by means of an agreement signed between the CSN and Enusa Industrias Avanzadas.

During this second period of the year, 73000 new gamma radiation measurements in the Almería, Granada and Malaga Provinces in Andalusia Community were done.

The Madrid Complutense, La Laguna, Oviedo, Extremadura and Cantabria Universities, contributed to the project, sending information about concentrations of natural radionuclides in soils. (^{40}K , ^{226}Ra and ^{232}Th).

The information about the Marna Project has been prepared by E. Suarez Mahou (CSN), D.García Pomar (Xunta de Galicia) and J.A. Fernandez Amigot (ENUSA).

Meetings attended/arranged and any results from these

Meetings attended.

- Second National Forum ERRICCA-2, held in Santiago de Compostela on 26th-28th June 2003. At this meeting, the following presentations were given.
 - *Progress related to radon from the Nuclear Safety Council.*
 - *Project "Marna-Galicia and Radon".Modelling.*
 - *New Building Code and Radon.*
- XVI Summer University Course held in Burgo de Osma (Soria) on 8th August 2003. At this course the lesson "*The National Radiological Background*" was given.
- II International Conference on Radiation Protection Training. Future Strategies, held in Madrid 17th-19th September 2003. At this meeting the Cantabria University-CSN presentation "*Experiences in radiological protection with natural sources*" was given.
- Fourth ERRICCA-2 meeting, in Copenhagen.10-11 November 2003. The CSN-Cantabria University presentation "*Radon Protection in the Spanish Building Code*" was given.

- Meeting at the Directorate General for Housing, Architecture and Planning, related to the Spanish Technical Building Code development. 24th July 2003

Meetings arranged.

The CSN has arranged the following meetings:

- *Meeting , with the “Eduardo Torroja” Institute of Construction Sciences, related to the Spanish Technical Building Code development. 16th September 2003.*
- *Meeting with Sevilla University concerning future natural radiation protection research projects agreements. 5th November 2003.*

Contributions made to work packages.

During the last six-month period, the CSN has continued the dissemination of information on natural radiation. This information in this period has been directed mainly to scientists, national and regional governments, the media and the public.

Information was supplied to the ERRICCA-2 website.

(Work package W2).

CSN, has also continued performing the gamma and radon maps of Spain, and has signed new research projects agreements with the universities contributing, in this way, to increase the knowledge about the exposure to natural sources.

The ERRICCA-2 questionnaires about “*Critical Evaluation of Radon Mapping Procedures used in Member Countries*” and “*Common Measurement Techniques and Protocols in Member Countries*” were completed.

(Work package W6).

CSN continues the collaboration with the Spanish Institute of Construction Sciences, for developing technical guidance for the protection against radon in new and existing buildings.

(Work packages W4 and W5)

Deliverables produced/Reports submitted

Over the last six months of the year the CSN has produced the following deliverables and reports.

- An article “*The protection against radon in the Spanish Technical Building Code*” in DGSNR magazine *Contrôle* n° 153, June 2003.

- An article. "*Radon Protection in the Technical Building Code*" in Nuclear Safety Council (CSN), second quarter magazine nº 27.
- A CU-CSN article "*Natural radiation exposure in the vicinity of Spanish nuclear power stations*" in Health Physics magazine Vol.85, Issue 5. November 2003.
- A draft of the next year CSN publication "*Radon in Spanish houses and other studies of natural radiation*". November 2003.
- A chapter "*Radiological protection against natural radiation sources*" to be included in a future CSN publication.
- A series of updated natural gamma radiation maps of the country.
- An UPC-CSN communication at the 29 Spanish Nuclear Society Annual Meeting 1-2 October 2003 Zaragoza. Spain "*Radon metrological quality in Spain*".
- A communication in the XVI Summer University Course. Burgo de Osma. Spain 8th August 2003 "*The National Radiological Background*".
- A Cantabria University-CSN communication in the Second International Conference on Radiation Protection Training. 17-19 September 2003. Madrid Spain. "*Experiences in radiological protection with natural sources*".
- A series of CSN presentations in the Second National Forum ERRICCA-2. 26-28 June 2003. Santiago de Compostela . Spain.
 - *Progress related to radon from the Nuclear Safety Council.*
 - *Project."Marna-Galicia and Radon". Modelling.*
 - *New Building Code and Radon.*
- A CSN-Cantabria University presentation in Fourth ERRICCA-2 meeting."*Radon protection in the Spanish Building Code*"

Proposed work for the next six months

The proposed work for the next six months, will be related to the following items mainly.

Participation in the Third National Forum ERRICCA-2 that will take place in Madrid in June 2004.

Participation in the 11th International Congress of the International Radiation Protection Association. May 23th-28th,2004 Madrid. Spain .

Promotion of new research projects related to mapping , radon in working places and dwellings and non nuclear industries.

Developing of the MARNA project fourth phase.

Radon protection in new buildings. Technical Building Code.

Any other observations or comments

Organisation Name: Radiological Protection Institute of Ireland	Organisation No: 4
Report Period: 1 July 2003 – 31st December 2003	
Report Prepared by: David Fenton	
Date: 9 December 2003	
Activities over the past six months	
<ol style="list-style-type: none"> 1. Attended and presented two papers at the 4th European Forum in Copenhagen in November 2003 2. Organised 2nd Irish National Radon Forum in October 2003 3. Set up Irish contribution to ERRICCA website. 4. Evaluated questionnaires from a number ERRICCA partners on deliverables 14 and 15 on mapping and measurement 	
Meetings attended/arranged and any results from these	
<ol style="list-style-type: none"> 1. 4th European Forum in Copenhagen in November 2003 2. Organised 2nd Irish National Radon Forum in October 2003 	
Contributions made to work packages	
<ol style="list-style-type: none"> 1. Evaluated returns from 10 ERRICCA partners on deliverables 14 and 15 on mapping and measurements. Preliminary findings were reported at the 4th European meeting in Copenhagen. The report will be advanced during 2004 	
Deliverables produced/Reports submitted	
<ol style="list-style-type: none"> 1. Preliminary findings of deliverables 14 and 15 were reported at the 4th European meeting in Copenhagen in November 2003. 	
Proposed work for the next six months	

- 1. Arrange format and venue for third Irish National Radon Forum.**
- 2. The report of deliverables 14 and 15 on mapping and measurements will be advanced during 2004. This work is on going and on target.**

Any other observations or comments

Organisation Name: CENTRAL MINING INSTITUTE,	Organisation No: MB24
Report Period: 1st July 2002 - 30th December 2003	

Report Prepared by: Malgorzata WYSOCKA
Date: : 5th of December 2003

Activities over the past six months <ul style="list-style-type: none">- national meeting,- field measurements of radon exhalation in areas affected by hard coal and Zn-Pb ores mining,- field measurements on reclaimed lands,- development of the method of radon exhalation measurements with use of thin layer of charcoal (open detectors): field measurements and calibrations in radon chamber.
Meetings attended/arranged and any results from these <ol style="list-style-type: none">1. Two meetings with students of different universities were held in Laboratory of Radiometry in Central Mining Institute.<ol style="list-style-type: none">A. 17th of November 2003 – students (20 person) of 6th semester of Faculty of Geology of Silesian University in Katowice,B. 19th of November 2003 – students (14 person) of 8th semester of Faculty of Mining Surveying and Environmental Engineering of University of Mining and Metallurgy in Cracow. <p>The plan of the meetings:</p> <ul style="list-style-type: none">- lecture “ Natural radioactivity in mining area of Upper Silesia” (M. Wysocka). In the frame of the lecture general information related to natural radioactivity was presented. A lot of emphasis was put on radon problems. Results of measurements of radon level in buildings, its concentrations in soil gas and exhalation from grounds were discussed. Students’ attention was focused on relationships between mining activity and radon potential. They asked a lot of questions about radioactive pollution caused by mining activity – contamination of grounds and surface waters, enhanced emission of radon from radioactive wastes and deposits;

- the presentation of the methods and the equipment of Lab. of Radiometry – visit in laboratories of: spectroscopy gamma, TLD, radiochemistry and radon measurements.
2. 26th of November 2003 – Mrs Ewa Krajny from Institute of Meteorology in Katowice was invited to present the lecture: “Relationship between radon exhalation from ground and depth of mixing layer of atmosphere”. The presented project was performed in collaboration with Lab. of Radiometry, Central Mining Institute. We invited members of Polish Radon Forum and scientists from different departments of the Institute (CMI) to attend this meeting. The presentation was followed by the discussion on problems presented by invited lecturer. It was emphasised that phenomena of radon emanation and its exhalation are dependent on many factors. Therefore their changes could be used as a supporting tool in observations of other phenomena. On the other hand it is very difficult to differentiate influences of specific factors on the specific stage of radon migration.

After the scientific part of the meeting the administrative meeting of National Forum took place. Problems related to the yearly cost statements and financial plans for 2004 were discussed. Building Research Institute (Warsaw) would like to join National Forum. Therefore the representative of the Institute attended our last meeting. Unfortunately because of lack of adequate number of members of the Forum the new candidate can't be formally introduced. Thanks closer relationships with Building Research Institute we hope to attract building industry to radon problems. Total number of participants was 32. Polish Radon Forum was represented by 13 members from: Central Mining Institute, Silesian University - Katowice, Institute of Nuclear Physics - Krakow, Technical University – Wroclaw, University of Mining and Metallurgy – Krakow.

Contributions made to work packages

Work Package W6

W8 (National Forum meeting)

W6 (measurements of radon in soil and exhalation rates)

Deliverables produced/Reports submitted

We had fulfilled and sent back questionnaire related to:

- Work Package W6, Deliverable 15 and Deliverable 14;

- Work Package W4, Deliverable 9 and Deliverable 10;
- Work Package W4, Deliverable 7 and Deliverable 8;
- ERSD - European Radon Solutions Database.

Proposed work for the next six months:

We would like to undertake once more efforts to attract to radon problems building industry.

We would like to persuade Polish regulators (Polish Agency of Atomic Energy) to reintroduce regulation on permissible radon levels in buildings.

Polish National Forum meetings:

- with building engineers, architects and town planners,
- with students of high schools and universities,
- with inhabitants of areas where radon level in dwellings is enhanced.

Any other observations or comments

Because of lack of regulations relevant to permissible radon levels in dwellings it is very difficult for us to communicate not only with building industry, owners of the buildings but with inhabitants of areas with enhanced radon potential as well. For that reason we should focus our attention and energy on lobbying Polish regulators to change regulations.

Organisation Name: Czech Technical University	Organisation No: 32
Report Period: 1st July 2003 – 31st December 2003	

Report Prepared by: Martin Jiránek

Date: 8th December 2003

Activities over the past six months

As a representative of CTU I have attended the fourth meeting in Copenhagen. Together with the industrial partner and the Czech Chamber of Authorized Engineers we organised our third national meeting. This meeting was held on 2nd December in Ústí nad Labem and was attended by approximately 30 people included representatives from local building authorities, local mitigation contractors, builders, designers and product manufacturers.

Meetings attended/arranged and any results from these

The Copenhagen meeting gave a very good opportunity to clarify with other partners what should we do in the future in the field of testing of radon barrier materials and how the results of testing could be used for the design of radon resisting membranes.

Our third national meeting provided a good opportunity for transfer of information about protection of new houses and remediation of existing houses and for disseminating information about ERRICCA2 project and European Radon Website. From the discussion it seems to us that the meeting was well received.

Contributions made to work packages

During the Copenhagen meeting I presented the contribution – Testing of Radon Barrier Materials - Aims, Philosophy, Results, in which I discussed the possibilities of using the results of testing for the design of radon resisting membranes.

Deliverables produced/Reports submitted

Proposed work for the next six months Together with other partners we would like to summarize the state of art in the filed of testing of radon resisting membranes.
Any other observations or comments

Organisation Name: <i>KVI/RUG</i>	Organisation No: <i>MB21</i>
Report Period: 1 July 2003 – 31 December 2003	

Report Prepared by: <i>E.R. van der Graaf</i>
Date: 4-12-2003

Activities over the past six months

EvdG attended the fourth European ERRICCA meeting in Copenhagen, 11-12 November 2003, during which the following presentations were made:

- 1) Pre- and post construction evaluation tools of radon protective measures in dwellings, progress so far and missing information.
- 2) Radon barrier testing: some remarks.
- 3) Dutch radon risk evaluation.

In the first presentation the progress on the evaluation of pre- and post-construction evaluation tools for new buildings and countermeasures was presented. Missing information was identified and the aim is to complete the information in 2004 by sending out a final questionnaire.

The second Dutch radon forum will take place in 10 December 2004 in Eindhoven, the Netherlands. The forum consists of an expert meeting on radon transport in building materials for specialists from science and industry. The goal of the meeting is to identify possible ways of reducing radon emission from materials and also possible other applications for the existing knowledge on radon transport in building materials, e.g. monitoring and evaluation of the condition of building materials by their radon emission properties. More than 15 persons have registered for the forum.

Meetings attended/arranged and any results from these

EvdG attended the fourth European ERRICCA meeting in Copenhagen, 11-12 November, 2003.

Contributions made to work packages

Draft report *Pre-and post construction evaluation tools of radon protective measures in buildings*, KVI Internal report R125 updated.

Deliverables produced/Reports submitted

Draft report *Pre-and post construction evaluation tools of radon protective measures in buildings*, KVI Internal report R125 updated.

Proposed work for the next six months

Update report: *Pre- and post- construction evaluation tools radon protective measures in buildings* (KVI Internal report R125). Include the comments and information from the new questionnaire to finalize the report.

Any other observations or comments

None

Organisation Name: <i>HERO and INTERPROJECT</i>	Organisation No: <i>MB34 and MB35</i>
Report Period: 1 July 2003 – 31 December 2003	
Report Prepared by: Ildiko Mocsy	
Date: 4-12-2003	

We include here the principal actions organised by Romanian partners at the ERRICCA 2 project.

1. In 19th May 2003 we have a large meeting organised by HERO and INTERPROIECT. At this meeting participants were students at the Sapientia Faculty, Environment Science Department. Was invited the mass media, and after the meeting we presented the “radon in homes” at the local radio.
2. In 17th/19th September was the Annual National Conference of the Romanian Radioprotection Society, titled “Some UE integrated aspects in Radiprotection”. On the base for our proposal was a workshop on “radon”. In this meeting was presented two paper by us. One of them was “ Intercomparison methods for radon exhale from soil and building materials”, results of the Praha experiment and other the radon in schools and kindergartens in Cluj. Both was in collaboration with the University Babes - Bolyai and University Sapientia.
3. In September the HERO and INTERPROIECT has a meeting with the officials from Cluj country. At this discussion was present: Vice President of Cluj county, Vice major of Cluj city, George Elkan and Ildiko Mocsy.
The theme was to start a project in our city in the new big construction aria including the radon measurements in the field and the base of the results we will make proposal for radon regulation in new constructions.
4. The project was start.
5. In and the October the County Council will organise a workshop for Officials, Mass Media, Builders, Architects where we will

present the our results on radon, the methods for prevention and proposals for regulation.

6. The leaflets was distributed in 400 copies for the population.

Observation

Unfortunately, we can not participate at the Dublin and Copenhagen ERRICCA 2 meetings, because we do not obtain the UE subvention.

Cluj, 7th December 2003

Ildiko Mocsy PhD``

Organisation Name: The Radon Council Limited	Organisation No: MB2
Report Period: July-December 2003	

Report Prepared by: Gavin Gilmore
Date: 20th January 2004

Activities over the past six months

Attendance at and contributions to a number of relevant subjects such as a full meeting of The Radon Council.

Consideration of additions/modifications to The Radon Manual.

Meetings attended/arranged and any results from these

Attendance at:-

ERRICCA 2 – 10th-11th November 2003, Copenhagen, Denmark.

Presentations at:-

ERRICCA 2 – topic was “Comparative analysis of short-term and long-term measuring devices.”

Results:-

Raising of awareness of variations in testing methods. The above talk highlighted that short-term testing can be an appropriate approach in combating the UK radon problem. Key issues highlighted include seasonal correction and the role of porous geology in affecting radon in homes.

Contributions made to work packages

Revision of the Radon Manual in relation to safety.

Further updates on the Radon Council website radonhotline.org with guidance notes for fan assisted radon reduction systems. The main focus of this article was to highlight that it is the responsibility of every installer (even a DIY installation) of electrical equipment, to ensure that the equipment is fit for the use to which it is being put and most importantly that it does not pose a threat to health during its working life. Attention being specifically drawn to compliance with electrical safety and European/National Regulations such as IEE Wiring Regs. 16th Edition as well as the

possible explosive risk from soil gases. Additional articles placed on the website include an article on a recent meeting with UK government officials on HIPS (see below for details) and an article stating the Radon Councils position re radon testing (“To Test costs less than a Guess”).

Deliverables produced/Reports submitted

Reports on the above activities in course of preparation.

The proposed home information packs (HIPS) put forward by the UK Government, and revision of CON29 for solicitors use was commented on. A delegation from the Radon Council met recently with Mr Elliot Morley MP, the Minister of State for Environment & Agri-Environment and representatives of DEFRA to put forward the Radon Council’s view. The purpose of this meeting was to explain the Radon Council’s concern at the unnecessary and avoidable tragic wastage of 2,500 lives each year (official estimate) from the effects of radon in the UK alone and ways by which this figure can begin to be reduced. Comments passed to the BRE Ltd concerning buying and selling buildings in radon affected areas, as part of Work package 2, re draft guidance document on a common protocol.

Proposed work for the next six months

Continuing to review actions and advice at time of conveyancing.

Any other observations or comments

We continue to believe that this project is having a worthwhile effect re raising the profile of radon in Europe. The Radon Council also believes that this will ultimately lead to a greater awareness of the health risks and remedial aspects involved, and encourage cooperation between expert bodies in the UK and abroad.

ERRICCA 2
European Radon Research and Industry Collaboration Concerted Action
European Commission Contract N°: FIRI-CT-2001-20142

SIX MONTHLY PROGRESS REPORT

Organisation Name: Risoe National Laboratory	Organisation No: CR3
Report Period: 1 July 2003 - 31^h December 2003	

Report Prepared by: Claus E. Andersen
Date: February 19, 2004

Activities over the past six months
Took part in the meeting in Copenhagen in November 2003.
Maintained the web-page in Danish describing ERRICCA. Organized the second meeting in the Danish National Radon forum.
Meetings attended/arranged and any results from these
Took part in the meeting in Copenhagen.
Organized National Radon forum i Århus (January 14, 2004).

Contributions made to work packages W8: Undertook discussions with various Danish professionals about the National forum. Filled out various questionnaires.
Deliverables produced/Reports submitted Uddated the Web-page: http://www.risoe.dk/nuk/erricca.htm
Proposed work for the next six months To organize the third meeting in the Danish National Forum.
Any other observations or comments None