

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

Description of work

PROPOSAL No: FIS5- 2001- 00038

Contract No : FIRI-CT-2001-20142

PROJECT

COORDINATOR: CO1 Building Research Establishment Limited, UK

CONTRACTORS : CR2 National Technical University of Athens EL
 CR3 Risoe National Laboratory DK
 CR4 Radiological Protection Institute of Ireland IRL

MEMBERS :

MB1 National Radiological Protection board	UK
MB2 The Radon Council Ltd .	UK
MB3 Hellenic Cement Research Centre Ltd	EL
MB4 Monarflex A-S	DK
MB5 Remedia Limited	IRL
MB6 Federal Agency for Nuclear Control	B
MB7 International Bureau for Environmental Studies	B
MB8 University de Cantabria.	E
MB9 Consejo de Seguridad Nuclear	E
MB10 Radiation and Nuclear Safety Authority	FIN
MB11 Insinööritoimisto Humi-Consulting Oy	FIN
MB12 Bundesamt Fur Strahlenschutz	D
MB13 Tracerlab, Umwelt-und Strahlenschutzgerate GmbH	D
MB14 Swedish Radiation Protection Institute	S
MB15 Radon Prevent AB	S
MB16 Swiss Federal Office of Public Health	CH
MB17 Istituto Superiore di Sanità	I
MB18 Österreichisches Forschungszentrum Seibersdorf GmbH	A
MB19 Österreichisches Forschungsinstitut für Chemie und Technik	A
MB20 Centre Scientifique et Technique du Bâtiment	F
MB21 Kernfysisch Versneller Instituut/RUG	NL
MB22 EERSTE Nederlanse Cement Industrie NV	NL
MB23 Instituto Tecnológico e Nuclear	P
MB24 Central Mining Institute	PL
MB25 District Construction Inspectorate Katowice	PL
MB26 Czech Technical University, Faculty of Civil Engineering	CZ
MB27 Radon v.o.s.	CZ
MB28 University of Veszprem	HU
MB29 Institute of Occupational Safety	SL
MB30 Inter Project	RO
MB31 Asociatia Pentru Sănătatea Mediului "HERO"	RO

DURATION : 36 MONTHS

PROJECT SUMMARY

The European Radon Research and Industry Collaboration Concerted Action (ERRICCA 2) will establish a European scientific led industrial forum aimed at reducing risks to health from radiation (principally radon) in the built environment.

The following topics and tasks have been identified as needing action if radon levels are to be reduced across Europe:

- European Radon Website
- Increasing public awareness and confidence
- Building materials
- Protection of new buildings
- Mitigation of existing buildings
- Measurement protocols

These topics will be used as the basis for discussion within the new forum which will bring together for the first time on a Europe wide basis scientific and industrial interests. The new forum will operate on two levels acting as a means for disseminating existing research findings to industry and the public, for clarifying industry needs for further research, and for undertaking collaborative work in common topic areas. It is important to note that the forum will not fund research activities :

European level – A European Forum, which brings together scientific and industrial representatives from 20 countries - one scientific and one industrial member from each country.

National level – A National Forum in each country to identify radon research and information needs and collaborate on research topics. The National Fora will feed ideas and issues into the European Forum and help disseminate output from the European Forum. The National Forum will be aimed at radon scientists, national and local governmental representatives, remediation companies, house builders, building contractors, materials suppliers, equipment manufacturers, measurement companies and representatives from the property buying and selling industry.

A series of briefing papers, common procedures, databases and toolkits covering the topics listed above will be prepared, to assist industry, legislators and the public in reducing the health risk from radon. The principal method of dissemination will be via a European Radon Website, the European and National Radon Fora established under this project and via the Natural Radiation Environment (NRE-VII) symposium 20-24th May 2002 in Greece.

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1.0 OBJECTIVES

The principal objective of the concerted action is to build upon the success of ERRICCA 1 (The European Research into Radon in Construction Concerted Action) in establishing a new European scientific led industrial forum to reduce risks to health from radiation (principally radon) in the built environment. The forum which will operate on both European and National levels will help in :

- disseminating existing research findings to industry and the public,
- clarifying industry needs for further research,
- and for undertaking collaborative work in common topic areas.

A range of research topics and tasks were identified earlier, in ERRICCA 1, as needing further investigation or action if radon levels are to be reduced across Europe. These topics will be used as the basis for discussion within the new forum, but now with additional industrial involvement.

ERRICCA 2 has several aims:

1. To bring scientific and industrial representatives from across Europe together to discuss common issues.
2. To enable scientific and industrial partners to collaborate on common issues, producing reports and common guidance materials.
3. To raise the general level of knowledge of radon across Europe.
4. To establish a network of National Radon Fora through which :
 - Information discussed at the European Forum can be disseminated nationally
 - National radon issues can be discussed in light of feedback from the European Forum
 - Local experience can be fed into the European Forum
 - Local problem areas can be identified and additional assistance can be sought from the European Forum.
 - The ERRICCA 2 Website (basis for a European radon website) can be promoted to national users - both for gaining information and for providing information.

At present few countries have any formal radon interest groups (outside government) through which radon problem areas can be identified and information and guidance can be disseminated. It is anticipated that by bringing together National and Local Governmental representatives, health and building professionals, and, materials and product manufacturers and suppliers, the National Fora established by ERRICCA 2 will have a major impact in resolving this problem and help to raise the general awareness of the radon problem across Europe.

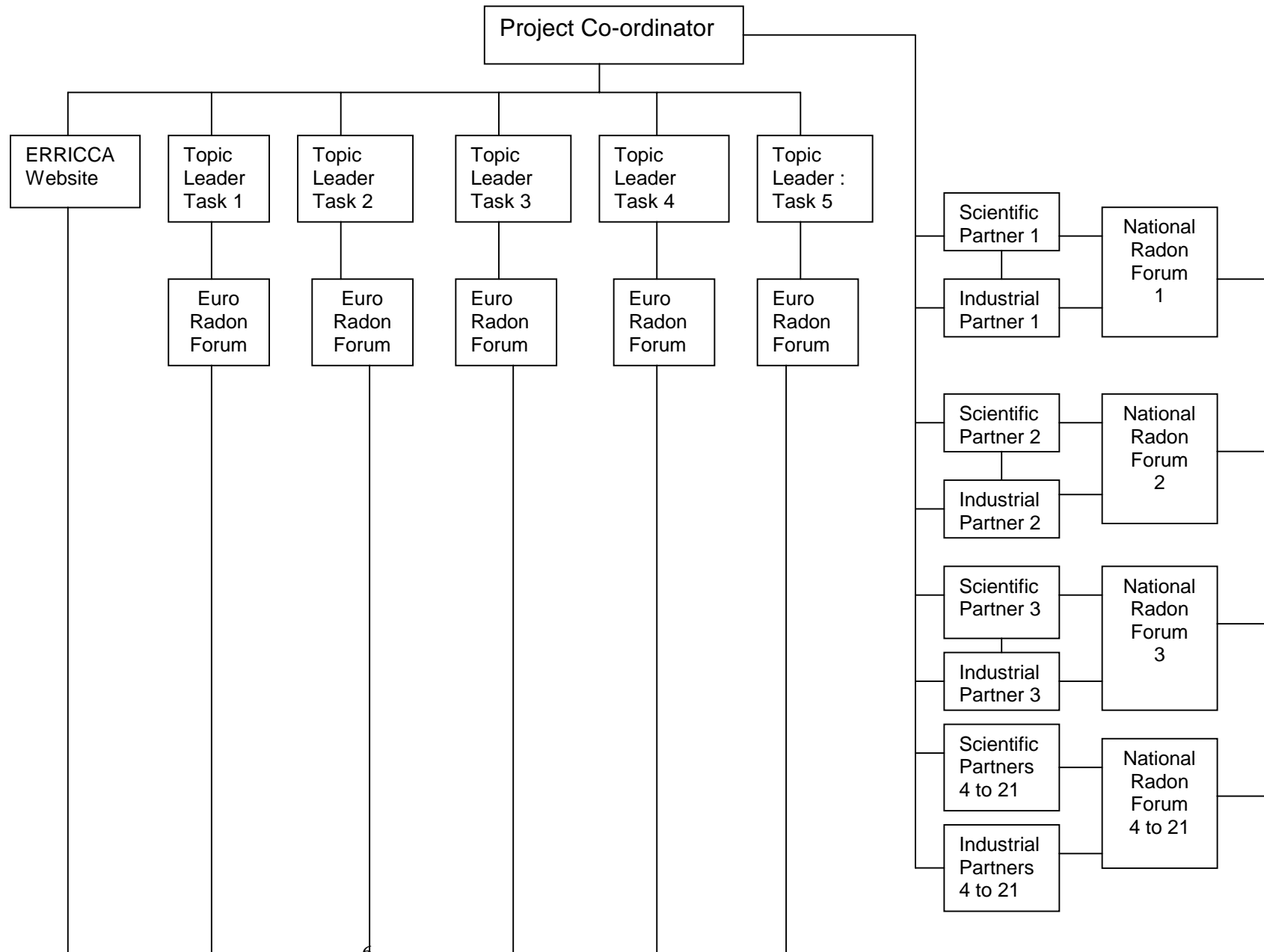
The objectives of the concerted action will be able to be measured and verified against the deliverables described in Tables B1, B2, and B3.

2.0 PROJECT WORK PLAN

Introduction

The project is essentially structured around five topic areas. These are linked through topic groups that will meet at five European Forum meetings during the three year life of the project. Feeding information into these meetings and disseminating the results from the meetings will be National Fora. These will be established by the scientific representative in each country. European meetings will be attended by a scientific and industrial representative from each country. Each National Fora meeting will be organised by the scientific representative for that country. In addition to the ERRICCA 2 scientific and industrial representatives from that country, the National Forum will be promoted in order to attract attendance from National and Local Governmental representatives, health and building professionals, and, materials and product manufacturers and suppliers.

In addition to the European and National Fora five technical topic groups will be established to consider the issues detailed in the work packages described in Table B3. These topic groups will be managed via Topic Group Leaders with each group meeting as part of the European Forum meetings. Partners will liaise between meetings largely using electronic mail. All partners can involve themselves in any of the five topic areas. To link everything together an ERRICCA 2 Website will be established. This Website is anticipated to form the basis for a European Radon Website.



Work Package and task leaders	Month after project start																																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36		
Website																																						
<i>NTUA</i>																																						
Topic 1																																						
<i>BRE</i>																																						
Topic 2																																						
<i>NTUA</i>																																						
Topic 3																																						
<i>Risoe</i>																																						
Topic 4																																						
<i>BRE</i>																																						
Topic 5																																						
<i>RPII</i>																																						
European Forum																																						
<i>BRE</i>																																						
National Fora																																						
<i>BRE</i>																																						

The Gantt chart gives an indication of anticipated duration of the different tasks and approximate target s for European and National Meetings. National Fora in particular will need to be timed to suit local circumstances. BRE as overall co-ordinators will act as task leaders for the European and national Fora, although individual meetings will be organised by local partners. Actual dates for meetings will be determined by the project start date, meetings will need to be timed avoid major holiday periods.

Table B1. Work package list

Work package No	Work Package Title	Lead Contractor No	Person months	Start month	End month	Deliverable No
W1	ERRICCA Website	CR2	2.0	1	36	D1
W2	Topic 1: increasing public awareness and confidence	CO1	2.5	1	36	D2 -D3
W3	Topic 2: Building Materials	CR2	3.0	1	36	D4-D6
W4	Topic 3: Protecting new buildings	MB4, MB21	4.74	1	36	D7-D10
W5	Topic 4: Mitigation of existing buildings	CO1	2.5	1	36	D11-D13
W6	Topic 5: mapping and measurement	CR4	2.5	1	36	D14 -15
W7	European Forum	CO1,CR2, CR3,CR4	2.5	1	36	
W8	National Forum -	CO1,CR2, CR3,CR4, MB6,MB8 MB10, MB12 MB14, MB16 MB18, MB20 MB21, MB23 MB24, MB26 MB28, MB29 MB 31,	34.704			

Table B2. Deliverables List

Deliverable no	Deliverable title	Delivery month	Nature	Dissemination level
D1	ERRICCA Website	12	O	PU
D2	Develop toolkit of materials to be used to establish a common European approach to raising public awareness.	32	O	PU
D3	Develop common guidance for buying, leasing and selling buildings to assist in raising awareness of radon during real estate transactions.	32	O	PU
D4	Common measurement and quality control protocols	35	Me	PU
D5	Develop measurement standards, models	35	Me	PU
D6	Develop common guidance for the testing of radon barrier materials. Develop common rating system for describing radon barrier materials, their capabilities and practical use.	35	Me	PU
D7	Compile information on Building Codes and regulation for radon protection of new buildings	34	Me	PU
D8	Review available radon protective construction techniques with an emphasis on cost, effectiveness, and durability.	34	Re	PU
D9	Identify and evaluate design tools such as pre-construction soil measurements of use in the planning stage of radon protection of new buildings.	22	Re	PU
D10	Identify and evaluate post-construction measurement procedures needed to assess the effectiveness of radon protective measures or other aspects of the system.	22	Re	PU
D11	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	34	Re	PU
D12	Increased background knowledge of radon entry into buildings	21	Re	PU
D13	Side effects of radon mitigation techniques	35	Re	PU
D14	Critical evaluation of mapping procedures used in the EU, assessing levels of cross-boundary inter comparability and preparation of clear and consistent mapping of radon risk and radon affected areas	33	Re	PU
D15	Common measurement techniques and protocols, for housing, workplaces, new buildings, water, radon emanation from building materials	33	Me	PU

WORK PACKAGE DESCRIPTIONS

Table B3.1	European Website
Work package Number : <i>W1</i> Start Date or starting event : <i>Kick-off Meeting</i> Partner Number : <i>CR2</i> Person months per partner : <i>2.0</i>	
Objectives <i>To establish a European Radon Website</i>	
Description of work <i>Develop a European Radon Website – initially containing ERRICCA 2 website – sub-sections to include -Public awareness, Materials, Newbuild, mitigation, mapping and measurement. The proposed WWW site development will follow the successful experience from WWW site developed for ERRICCA 1. The new WWW site aims:</i> <ol style="list-style-type: none"> <i>a. To provide a communication forum for ERRICCA-II participants,</i> <i>b. To establish an information source for all participants, the industry, National and EU authorities and the public, regarding radon.</i> <i>c. To the dissemination of information, results and conclusions of the national and international forums held in the frame of the project.</i> <i>The will be user-friendly and easy-to-use and will have links to the most important radon www-sites all-over the world.</i>	
Deliverables <i>Publicly accessible Website</i>	
Milestones and expected results <i>Ongoing development throughout project</i>	

Table B3.2	Increasing Public awareness
Work package Number : <i>W2</i> Start Date or starting event : <i>Kick-off meeting</i> Partner Number : <i>CO1</i> Person months per partner : <i>2.5</i>	
Objectives <i>Topic 1: increasing public awareness and confidence in reducing radon risk across Europe.</i>	
Description of work <i>Investigate ways of increasing public awareness of radiation in the built environment, and attitudes towards the radon problem. To develop common European approach to providing information on radiation in built environment, and common guidance for buying, leasing and selling buildings to assist in raising awareness of radon during real estate transactions.</i>	
Deliverables <i>Toolkit of materials to be used to establish a common European approach to raising public awareness. Common guidance for buying, leasing and selling buildings to assist in raising awareness of radon during real estate transactions.</i>	
Milestones and expected results <i>Common Web based materials for use across Europe for raising public awareness of radon risk and its reduction.</i>	

Table B3.3	Building Materials
Work package Number : <i>W3</i> Start Date or starting event : <i>Kick-off meeting</i> Partner Number : <i>CR2</i> Person months per partner : <i>3.0</i>	
Objectives <i>Topic 2: Develop common measurement procedures for radon emanation from building materials, and common guidance on testing etc. of radon barrier materials.</i>	
Description of work Develop common measurement and quality control protocols for testing exhalation rate from building materials. Investigate developing measurement standards, models etc for Gamma radiation from materials. Develop common guidance for the testing of radon barrier materials. Develop common rating system for describing radon barrier materials, their capabilities and practical use.	
Deliverables Common measurement and quality control procedures for radon emanation from building materials and radon barrier materials.	
Milestones and expected results Common protocols where none exist at present. Increased guidance.	

Table B3.4	Protecting new buildings
<p>Work package Number : <i>W4</i> Start Date or starting event : <i>Kick-off meeting</i> Partner Number : <i>MB4 and MB21</i> Person months :<i>4.74</i></p>	
<p>Objectives</p> <p><i>Topic 3: to improve the knowledge and general approach to protecting new buildings from radon.</i></p>	
<p>Description of work</p> <p><i>Topics to be considered : Compile information on Building Codes and regulation for radon protection of new buildings and comment on the opportunities or difficulties for a common European approach. Review available radon protective construction techniques with an emphasis on cost, effectiveness, and durability. Identify and evaluate design tools such as pre-construction soil measurements of use in the planning stage of radon protection of new buildings. Identify and evaluate post-construction measurement procedures needed to assess the effectiveness of radon protective measures or other aspects of the system.</i></p>	
<p>Deliverables</p> <p><i>Web-based materials, guidance, toolkit. Report on Building codes and regulation for radon protective measures for new buildings.</i></p>	
<p>Milestones and expected results</p> <p><i>Improved information and guidance on radon protective measures for new buildings . Increased knowledge and proof of the long term durability of radon protective measures</i></p>	

Table B3.5	Radon mitigation
Work package Number : <i>W5</i> Start Date or starting event : <i>Kick-off meeting</i> Partner Number : <i>CO1</i> Person months per partner : <i>2.5</i>	
Objectives <i>Topic 4 to expand existing knowledge of radon mitigation of existing buildings</i>	
Description of work <i>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.</i>	
Deliverables <i>Establish Web based database of products, components, materials and case studies. Exchange of information via meetings and conferences. Exchange of information regarding adverse side effects of mitigation techniques – establish database of case studies. Prepare guidance to overcome problems.</i>	
Milestones and expected results <i>Increased knowledge of radon mitigation and improved accessibility of information</i>	

Table B3.6	Mapping and Measurement
Work package Number : <i>W6</i> Start Date or starting event : <i>Kick-off meeting</i> Partner Number : <i>CR4</i> Person months per partner : <i>2.5</i>	
Objectives <i>Topic 5. To improve radon mapping techniques across Europe and to identify common measurement techniques and protocols.</i>	
Description of work <i>Critical evaluation of mapping procedures used in the EU, assessing levels of cross-boundary inter comparability and preparation of clear and consistent mapping of radon risk and radon affected areas. Common measurement techniques and protocols, for housing, workplaces, new buildings, water, radon emanation from building materials.</i>	
Deliverables <i>Report on Mapping. Database of common measurement techniques.</i>	
Milestones and expected results <i>Improved and common approach to mapping. Information on common measurement techniques.</i>	

Table B3.7	European Forum
<p>Work package Number : <i>W7</i> Start Date or starting event : <i>Kick-off meeting</i> Partner Numbers: <i>CO1,CR2, CR3,CR4 and CO1</i> Person months per partner : <i>0.50</i></p>	
<p>Objectives</p> <p><i>To bring all partners together to co-ordinate collaborative actions, feed in information from National Fora, and take away information for dissemination and consideration at National Fora.</i></p>	
<p>Description of work</p> <p><i>To organise one of five European Forum meetings to be attended by all participants (Partner 1 to organise first and last meetings)</i></p>	
<p>Deliverables</p> <p><i>Meeting facilities, minutes of meeting to be posted on the ERRICCA 2 Website</i></p>	
<p>Milestones and expected results</p> <p><i>It is planned to hold five meetings during the project : targeted to be held during months 3,11,17,24,33.</i></p>	

Table B3.8	National Forum
<p>Work package Number : <i>W8</i> Start Date or starting event : <i>1st National Radon Forum</i> Partner Numbers : <i>CO1,CR2, CR3,CR4, MB6,MB8, MB10, MB12, MB14, MB16, MB18, MB20, MB21, MB23 MB24, MB26, MB28, MB29 and MB 31,</i> Person months per partner : <i>1.83</i></p>	
<p>Objectives</p> <p><i>To establish a National Radon Forum for all interested parties working on radon within each partner country. It is anticipated that the Forum will be attended by Scientists, local and national government representatives, environmental health specialists, designers, engineers, builders, building surveyors, specialist radon companies and product manufacturers</i></p>	
<p>Description of work</p> <p><i>To identify problem areas for which further research is needed or advice and guidance is sought. To act as route for feeding information into the European Forum and collaborative work of the ERRICCA participants Network. It will also be used as a route for disseminating information from the European Forum from ERRICCA 2 participants. It will also be used to promote widespread use of the ERRICCA European Radon Website.</i></p>	
<p>Deliverables</p> <p><i>Three National Forum during the duration of the project. (Year 1, Year 2, and Year 3) Minutes to be posted on the ERRICCA 2 Website</i></p>	
<p>Milestones and expected results</p> <p><i>Three meetings : Approximately one year apart in months 4-5, 15-16 and 27-29, actual dates to suit local consditions. Improved dissemination of information, advice and guidance on radon across Europe</i></p>	

3.0 SCIENTIFIC and TECHNICAL PROSPECTS

A major aspect of this project is to increase dissemination of information on radiation in the built environment. Dissemination will take place on three levels:

European Forum

The European Forum will meet five times during the three year project. It will be attended by the scientific and industrial partners who represent each country. 20 countries will be represented. The Forum will discuss a range of topic areas - public awareness, building materials, radon mitigation, radon protection in new buildings, and radon measurement and mapping. This will include input from the National Fora in each country. Information from the European forum will then be cascaded down to the National Fora via the national representatives.

National Forum

It is intended that each national scientific representative will set up a National Forum. This will discuss national issues that can feed into the European Forum, whilst also be a vehicle for disseminating issues discussed at the European Forum. The National Forum will be attended by a wide a range of interested parties, reflecting national needs and approach to dealing with the problem. It is anticipated that these meetings will be attended by representatives from national and local governmental agencies, radon scientists, health professionals, environmental health specialists, building surveyors, builders, engineers, radon specialists and property sales specialists. These attendees will in turn disseminate information to their own teams.

Website

The ERRICCA 2 website will link all of the parts of the project together it will be used to disseminate information from the European Forum, National Forum and topic groups. It will be able to be accessed by all scientific and industrial partners, attendees of National Forum meetings as well as the general public. It is planned to also provide links to partners Web sites.

Although primarily targeting the radon field the information that will be made available via ERRICCA 2 will have relevance to other areas : contaminated land, indoor environment, sustainable construction, electrical industry, health, education, and other construction related industries.

It is envisaged that all results from the project will be made available via the Website. This will include dissemination of minutes from meetings, reports from topic groups, toolkits and databases developed within the project.

Technology Implementation Plan

To manage the exploitation and dissemination of results an exploitation committee will be established comprising the co-ordinator, website and topic leaders.

Appendix A

Obligations and schedule for meetings and reporting

Table A 1: Schedule and deadlines for reporting and cost statements

Reports/Cost Statements		Submission time (time after contract start – months)
Reports		
Minutes of European Forum - Progress meeting		3,11,17, 24 and 34
Minutes of National Forum		5, 16 and 28
Minutes of topic leader meetings		Within one month of meeting
Minutes of Co-ordinator meetings		Within one month of meeting
Periodic Progress Reports	six month report	6,12,18, 24, 30, and 36
	Annual scientific and technical report	12, 24 and 36
Mid term report		18
Final Report		36
Draft Technology Implementation Plan		5
Interim Technology Implementation Plan		18
Final Technology Implementation Plan		34
Supplementary reports		as indicated under deliverables
List of all reports prepared within the contract		36
Cost statements		
Periodic cost statement		12, 24, 36