THE INTERNATIONAL EMF PROJECT

PROGRESS REPORT 2003-2004

SUMMARY

This ninth progress report for the International EMF Project covers activities and outputs for the period May 2003 to June 2004. The report has been formatted according to scheduled EMF Project activities: health risk assessments; scientific reviews; research co-ordination; harmonization of EMF standards; risk perception and communication. Current details of the EMF Project, its activities and outputs can be found on our constantly updated home page at: http://www.who.int/peh-emf/

A workshop on the effects of static magnetic fields on the human body was held at the National Radiological Protection Board (NRPB) 26-27 April 2004, and the results will be published as a special volume of the Progress in Biophysics and Molecular Biology in late 2004 (Vol. 87, Nos. 2 and 3).

The long process of conducting health risk assessments of exposure to static and ELF fields is continuing. The final draft of the static fields monograph should be ready for a formal WHO Task Group meeting towards the end of 2004. A draft of the ELF fields monograph will be completed before the end of 2004 and subjected to a formal WHO Task Group meeting in April 2005.

The standards harmonization framework has been re-drafted following numerous inputs and sent to IAC members for final review. Approval of the report is expected at the June 2004 meeting of the IAC and publication before the end of the year. As soon as the framework is completed it will be published on the EMF Project web site.

A Model Act and Model Regulations for protection of people from exposure to EMF have been drafted for member states who wish to have, but who do not have the resources to produce, such legislation. These will now receive wide review before finalisation in early 2005.

The US National Institute for Occupational Safety and Health (NIOSH), a WHO Collaborating Centre for occupational health, is working with the EMF Project to draft a monograph on Occupational EMF Management. This document should be available for review in late 2004.

Discussions are underway on the possible development of "distance learning" courses, focused educational programmes for children (TV, radio and in schools), and development of a generic public information brochure.

An updated EMF Project pamphlet is being drafted and should be available before the end of 2004.

HEALTH RISK ASSESSMENTS

The primary goal of the International EMF Project is to review the scientific literature on health effects of EMF within the frequency range 0 to 300 GHz, to assess the health risks and to develop policy options for protection of people from EMF exposure. The results will be published as Environmental Health Criteria (EHC) monographs. We have embarked on the health risk assessments for exposure to static and ELF fields. Based on the large literature on static fields which has never been thoroughly reviewed, we have decided to develop two separate monographs, one for static fields and one for ELF fields.

The EHCs are the result of in-depth weight-of-evidence critical reviews conducted through independent, scientific peer-review groups on various topics related to exposure of people to static and time varying electric and magnetic fields. The reviews will build on excellent reviews already completed and update them with the more recent literature. Reviews will primarily focus on the peer review literature, however reports and other publications of well-conducted research not in the peer review literature will also be considered.

Once the first drafts of the chapters are complete they will be peer-reviewed. Comments will be incorporated and a combined report will be subjected to a formally constituted WHO Task Group meeting. Membership of WHO Task Groups is approved by the Executive Director (Sustainable Development and Healthy Environments) of WHO and will comprise representatives of the drafting committees and experts appointed by speciality, gender and geographical distribution. Following WHO technical review and editing, the final document will be published by WHO.

Schedule of assessments and progress

The schedule for formal WHO Task Group reviews of the EMF literature is shown below:

2001	IARC carcinogen identification and evaluation of static and ELF fields
2004	WHO health risk assessment of static fields
2005	WHO health risk assessment of ELF fields
2005	IARC carcinogen identification and evaluation of RF fields
2006-7	WHO health risk assessment of RF fields

SCIENTIFIC REVIEWS

To assist the development of the Environmental Health Criteria monographs for both static and ELF fields, specialised workshops have been conducted. These included a workshop on "Weak ELF Electric Field Effects in the Body" in March 2003 and a workshop on the effects of static fields 26-27 April 2004. Both workshops were organised and held at NRPB and cosponsored with ICNIRP and NRPB.

The purpose of these Workshops was to:

- Present the state-of-the-science on the effects of exposure of static and ELF fields on mammalian cells and tissues, the foetus, sensitive organs (e.g., brain and heart) and the whole body.
- Define, where possible, any thresholds and exposure times causing adverse effects in biological systems.
- Publish the proceedings of the meetings in peer reviewed scientific journals.

- Provide input for health risk assessments and publication in the Environmental Health Criteria
- Provide information useful for development of static and ELF field exposure standards.

Additional specialized workshops are scheduled on topics of concern, the results of which will contribute to the health risk assessment process. These workshops are:

- EMF and Children (7-9 June 2004, Istanbul, Turkey) to review available evidence to determine if children, at any age, could be more sensitive to EMF exposure than adults.

- Hypersensitivity to EMF (25-27 October, 2004, Prague, Czech Republic) to review scientific evidence that certain people may be sensitive to EMF and display symptoms resulting from their exposure.

Scientific meetings are additionally held in countries having large research programmes, but where most of the results are published in a language other than English and so are not widely available for the scientific review process. These meetings provide the opportunity to allow key scientists to summarize their results so that they can become part of WHO's world wide review process for determining possible EMF health risks.

An Eastern European meeting on EMF standards and research is scheduled to be held in Moscow, Russia on 20-23 September 2004. This workshop will review standards and current research. Important discussions will focus on the scientific evidence for Eastern European standards and review standards in the different parts of Eastern Europe.

RESEARCH CO-ORDINATION

An RF research update meeting was held in Geneva June 11-13, 2003. This meeting provided an opportunity to identify research gaps that could be filled before the health risk assessment process took place in 2005-6. The updated RF research agenda was posted on the WHO web site in late 2003. Since posting this report there have been requests for a rationale on the additional research needs. This will be completed before the end of 2004 and posted on the web site.

The EMF Project has also worked with national programmes to encourage them to assist with the research needs identified by WHO. Outstanding among these has been the Mobile Telephone Health Research programme (MTHR) in the UK where research needs were broadly based on the WHO research agenda and approximately $18million is being spent. Results of this excellent programme are now beginning to be published and are responding to key health issues raised by non-replicated studies and areas of concern not properly addressed by previous research. A similar programme was set up in Germany in 2002 with a budget of 17 million Euros. The results will be available in 2006/2007.

Research needs for static fields were discussed at the Static Magnetic Fields workshop in April 2004 and these will be posted shortly on the web site. Very little research, useful for setting health based exposure standards, has been conducted in this area. Many new technologies are using these fields at even higher strengths, especially magnetic resonance imaging for medicine (fields of 10 T and higher are now being used). Further elaboration of static magnetic field research needs will be made as part of the EHC process at the formal Task Group review before the end of 2004. Obviously recommended research for static magnetic fields will not even start before the EHC for static magnetic fields is completed, but it is important that WHO identify

areas of potential health concern for further research before new technologies become commonplace.

Such is the lack of knowledge about possible health consequences from static magnetic fields that WHO will be contacting the EC to have them consider this as a priority research area for their 7th Framework. The EC used WHO's EMF Research Agenda as a basis for their 5th Framework research priorities some 5 years ago, making some 20 million euros available for important research areas.

Research needs for ELF will be updated as part of the review for EHC. From our knowledge accumulated so far, the key area of research is to identify why the epidemiological studies show a relationship between ELF magnetic fields and childhood leukaemia, while laboratory studies do not support the possibility that these fields could initiate, promote or progress cancer.

The EMF Research Database is being updated and maintained with the support of COST 281. This is a collaborative project that the EMF Project has established with COST 281 over the past 6 months. WHO sincerely appreciates help with such an important but time-consuming task.

EMF RISK MANAGEMENT

WHO is now collaborating with the US National Institute of Occupational Safety and Health (NIOSH) to draft a document entitled "Occupational EMF Management". Inputs from the recently issued directive from the European Commission on this topic and a monograph published by the Finnish Institute of Occupational Health will contribute to this report. In addition the International Labour Organization will assist to compile the final report.

As a complementary report to the occupational management programme, a report on Public Health Management of EMF will be started soon and use the many inputs from national programmes and especially the policy options drafted along with the EHC reviews. Such a report will also utilise the Precautionary Framework.

PRECAUTIONARY FRAMEWORK

Technological developments using static magnetic fields have progressed rapidly over the past decade. Magnetic resonance imaging techniques are now moving towards using fields over 10 T, something not envisaged a few years ago. Possible health effects arising from exposure to ELF fields have been the subject of research for many years, but without definitive scientific resolution. In the RF range, rapid growth and commercialization of new technologies such as mobile wireless telecommunications have raised concerns that continuous exposure to these fields could have long-term health consequences. Considerable public anxiety has arisen over the roll-out of mobile phone base station networks, without due consideration of people's feelings or input. This uncertainty has lead governments and the public to believe that a more cautious approach should be taken when managing EMF risks.

Managing EMF risks using precautionary approaches represents challenges and opportunities for scientists, policy makers and the public. Responding to the need to provide a framework and test it in a case study, the World Health Organization, the European Commission and the National Institute of Environmental Health Science conducted a 3 day meeting on "Application of the Precautionary Principle to EMF". This meeting, held in Luxembourg on February 24-26, 2003, brought together international experts whose individual perspectives led to the synthesis of an

approach that recognizes and accommodates the diverse disciplines necessary for successful implementation of rational precautionary measures in the face of scientific uncertainty.

As the result of the input received at the workshop, WHO drafted its document focusing on the development of an overarching framework for use of precautionary measures at each stage of the risk management cycle. This document has undergone a number of reviews and is to be discussed further at the IAC meeting in Istanbul.

This framework has a case study on ELF fields and another is being developed for RF fields. Case studies in other areas of health concern will be drafted since the framework is to deal generally with public health protection in areas of scientific uncertainty, and not just for EMF.

EMF RISK PERCEPTION AND COMMUNICATION

A user-friendly handbook for governmental and non-governmental organizations, and individuals interested in this topic was published in 2002. It is entitled "Establishing a dialogue on risks from electromagnetic fields" (ISBN 92 4 154571 2). This handbook was also formatted for downloading on the EMF web site: http://www.who.int/peh-emf/publications/risk_hand/en/ The handbook is currently available in electronic versions online at the EMF Project website in: English, French, Spanish, German, Italian, and Japanese. Although a printed version is currently only available in English and Italian, we are in the process of having a French, Spanish and Russian version prepared for publication. A Dutch translation is being prepared.

For the English version, 3000 copies were printed and most distributed free. Total sales from WHO amounted to 425 copies (of which 60 copies in developing countries). For the Italian version, 50,000 copies were printed and distributed widely throughout Italy.

Anyone interested in translating the Handbook into other languages should contact WHO.

HARMONIZATION OF APPROACHES TO THE DEVELOPMENT OF EMF STANDARDS

The purpose of this activity was to work towards, and hopefully achieve, international agreement on a framework for developing guidelines on protection of the public and workers from exposure to EMF. Development of the framework has been carried out by working groups formed to address the key components. Working group meetings have been held, generally in conjunction with scientific meetings in key geographical regions that will allow the input of scientists and government officials in those regions. One goal of setting up the working groups is to enhance the quality of communication among scientists and government officials, in examining the scientific basis for the standards and the assumptions that underlie them.

The overall plan is to comply with the World Trade Organization (WTO) recommendation that any standards that affect trade should be developed in conjunction with both developed and developing countries. Meetings have been established to cover all geographical regions to allow scientists to have input to a process that is envisaged to lead to a common international standard. Currently all 6 regions of WHO have had meetings allowing input from scientists and government officials in each region. A final working group meeting was held in Guilin, China in October, 2003 to obtain the important inputs from Chinese scientists.

A framework has been re-drafted based on numerous inputs and has been mailed to IAC

members for final review and approval at the Istanbul 2004 meeting. The final framework will be published and placed on the web site before the end of 2004.

ADMINISTRATION

Role of WHO

In 1996 WHO established the International EMF Project and defined its activities and workplans. WHO acts as the Secretariat to coordinate, facilitate and implement the Project. EMF Project Working Groups are comprised of internationally-recognized experts representing a wide range of diverse opinions on the subject under deliberation. WHO staff cannot be members of any EMF Project Working Group but are present at meetings to facilitate reaching consensus agreement on conclusions or recommendations

The International EMF Project scientific reviews meetings are generally conducted in conjunction with ICNIRP (WHO's formally recognized NGO for NIR protection). These review meetings are open to any scientist, but working group membership is restricted to independent (non-industry) scientists. WG conclusions and recommendations are published in scientific peer-review journals to ensure that the information is made available to as wide an audience as possible.

All publications of the EMF Project are reviewed by the International Advisory Committee. This oversight Committee is composed of representatives of over 50 national authorities, 8 international agencies and WHO collaborating centres. Formal approval by WHO management is required of all publications. Once a scientific review is completed, WHO uses the conclusions and recommendations in its information for national authorities and the public.

This year has been very busy with requests for presentations on the state of science and the EMF Project well in excess of what could be handled. WHO attempts to fulfill requests especially when it comes from national authorities. For the list of meetings with presentations by WHO staff see below.

Funding

Over the past year there have been questions raised as to the funding sources of the EMF Project. A summary of funding sources and conditions are given below. There are very strict requirements for WHO to receive funds for extrabudgetary projects, such as the EMF Project. WHO can receive funds from industry (preferably from industry associations) only after review and approval by WHO's Legal office. A special WHO committee provides further review of funding from industry. All contributions and accounting are strictly audited by WHO and the Royal Adelaide Hospital (RAH). The EMF Project has adhered to all the requirements placed on it by WHO and will continue to do so until the Project concludes.

Personnel and Structure

The Radiation and Environmental Health Unit has the responsibility for all WHO activities related to ionizing and non-ionizing radiations (including the International EMF Project) and is managed by Dr. Michael Repacholi.

Dr Emilie van Deventer has a part-time post in the EMF Project. Emilie is a professor in electrical engineering at the University of Toronto. She is responsible for development of the

Precautionary and Standards Frameworks and other documents of the EMF project. She also responds to the large number of enquiries that the Project receives each week.

Dr Richard Saunders has joined the team on sabbatical from the National Radiological Protection Board in the United Kingdom. Rick is responsible for the local oversight of the EHCs on static and ELF fields. He also assists with lectures on EMF topics in various meetings for the Project.

Dr Leeka Kheifets has been contracted to assist the EMF Project on the development of the EHC monographs, and is assisting with research related activities and scientific programmes for workshops.

Dr Eric van Rongen has been part-time seconded by the Health Council of the Netherlands to the EMF Project. He has been coordinating the Working Group on Static Fields and continues to be involved in work on the static fields EHC.

Ms Sarah Bullock continues to provide administrative support for the Unit's NIR activities.

EMF PROJECT RESOURCES

National contacts and information

The EMF Project will be placing on its web site a list of national contacts dealing with the EMF issue. This will allow people to dialogue with their local representative on queries of a local/national nature. In addition the summaries of key activities and concerns provided by national authorities of the IAC will be posted on the web site for information within the next couple of months.

Home page

The EMF Project home page (at http://www.who.int/peh-emf/) is continually updated and has much useful current information. It is hoped that, over the next few years, distance learning programmes will be developed. The EMF Project is in discussion with a number of potential collaborators to assist with this endeavour. Topics include:

- Quality criteria for studies to be useful in health risk assessments
- Children's web site to learn about EMF
- Others…..

We are currently in discussion with WHO information technology staff to measure the use of our web site through relevant indicators (number of hit counts, downloads, etc).

Brochures

'Establishing a dialogue on risks from electromagnetic fields' (ISBN 92 4 154571 2) is available from the web site at: http://www.who.int/peh-emf/publications/risk_hand/en/. For further information on this, please refer back to page 5, paragraph on "EMF Risk Perception and Communication."

An extensive booklet on Electromagnetic Fields was drafted for the WHO European Regional Office. It is written for the lay public and local authorities, and was published in early 1999. This booklet gives details on the physical characteristics and biological effects of EMF,

standards and protective measures, and is presented in a glossy format with many colour pictures and diagrams for ease of comprehension. Copies can be ordered directly on the web site at: www.who.dk/environment/pamphlets or from the United Kingdom Chartered Institute of Environmental Health, Chadwick Court, 15 Hatfields, London SE1 8DJ, UK. An updated version is currently under consideration by WHO/EURO and the EMF Project.

EMF Project Pamphlet
An updated pamphlet describing the activities and outputs of the EMF Project is currently being prepared and will be available in the next few months both as a publication and on the web site.

Fact Sheets
Several new Fact Sheets and Information Sheets are going through the approval process and will be available shortly. Topics include:

- Microwave ovens
- Environmental effects of EMF
- Medical response to RF overexposure
- Health effects of Intermediate Frequency EMF

Fact sheets will be compiled on the following topics after completion of the relevant workshops

- Children and EMF
- Electrical hypersensitivity

In addition, an updated Fact Sheet is being prepared on Mobile Phone Base Stations and Wireless Networks. It is hoped this will be published in the next 6 months.

The following WHO Fact Sheets concerning EMF have been published in many languages and are downloadable from the web site:

- Electromagnetic Fields and Public Health: The International EMF Project. WHO Fact Sheet #181 Oct. 1997, revised May 1998.
- Electromagnetic Fields and Public Health: Physical Properties and Effects on Biological Systems. WHO Fact Sheet #182 Oct. 1997, revised May 1998.
- Electromagnetic Fields and Public Health: Health Effects of Radiofrequency Fields. WHO Fact Sheet #183 Oct. 1997, revised May 1998.
- Electromagnetic Fields and Public Health: Public Perception of EMF Risks. WHO Fact Sheet #184 Oct. 1997, revised May 1998.
- Electromagnetic Fields and Public Health: Mobile Telephones and their Base Stations. WHO Fact Sheet #193, revised June 2000.
- Video Display Units (VDUs) and Human Health. WHO Fact Sheet #201 July 1998
- Electromagnetic Fields and Public Health: Extremely Low Frequency (ELF). WHO Fact Sheet #205 November 1998.
- Electromagnetic Fields and Public Health: Radars and Human Health. WHO Fact Sheet #226 June 1999.
- Electromagnetic Fields and Public Health: WHO Backgrounder on Cautionary Policies. March 2000
- Electromagnetic Fields and Public Health: Extremely low frequency fields and cancer. WHO Fact Sheet #263 October 2001

Press Releases

The following have been published by WHO on the Project:

- WHO Launches New International Project to Assess Health Effects of Electric and Magnetic Fields. Press release WHO/42, 4 June 1996.
- Electromagnetic fields: Experts Met in Vienna to Assess Public Perceptions of Risks. Press release WHO/75, 23 October, 1997.
- Health Effects of Electromagnetic Fields: WHO Recommends Research Priorities. Press release WHO/95, 19 December 1997.
- Scientists Meet in Moscow to Discuss Adverse Effects of Electromagnetic Fields. Press release WHO/38, 20 May, 1998.
- WHO Launches an Initiative to Harmonize Electromagnetic Field Standards Worldwide. Press release WHO/88, 17 November 1998
- More information necessary to establish health effects of mobile phones. Press release WHO/45, 28 June 2000.
- WHO clarifies its position on health effects of mobile phone use. Note for the press No 14 10 October 2001
- Clarification of mooted relationship between mobile telephone base stations and cancer. Statement WHO/1 23 January 2002.

EMF Project Scientific Journal Publications

- M H Repacholi, E Cardis (1997): Criteria for EMF Health Risk Assessment. *Radiation Protection Dosimetry* 72: 305-312.
- M H Repacholi (ed) (1998): Low-Level Exposure to Radiofrequency Electromagnetic Fields: Health Effects and Research Needs. *Bioelectromagnetics* 19: 1-19 (1998)
- M H Repacholi and B Greenebaum (eds) (1999): Interaction of Static and Extremely Low Frequency Electric and Magnetic Fields with Living Systems: Health Effects and Research Needs. *Bioelectromagnetics* 20: 133-160.
- A F McKinlay and M H Repacholi (eds) (1999): Exposure metrics and dosimetry for EMF epidemiology. *Radiation Protection Dosimetry* 83(1-2): 194.
- K H Foster, P Vecchia, M H Repacholi (2000): Science and the Precautionary Policy. *Science* 288: 979-981.
- G Mezei, L Kheifets (2001): "Is There any Evidence for Differential Misclassification or Bias Away from the Null in the Swedish Childhood Cancer Study?" Letter to the Editor, *Epidemiology* 12(6):750.
- L Kheifets, R Greenberg, R Neutra, G Hester, C Poole, D Rall D, G Banerjee (2001): From epidemiology to policy: An EMF case study. *American Journal of Epidemiology* 154(12): S50-59.
- L Kheifets, G Hester, G Banerjee (2001): The Precautionary Principle and EMF: Implementation and Evaluation. *Journal of Risk Research* 4(2): 113-125.
- L Kheifets (2001): Electric and Magnetic Fields and Occupational Health. *Patty's Industrial Hygiene and Toxicology*, Fifth Edition 100: 141-198.
- L Kheifets (2001): Electric and magnetic field exposure and brain cancer. *Bioelectromagnetics* 5: S120-S131.
- M H Repacholi (2001): Health risks from the use of mobile phones. *Toxicology Letters* 120: 323-331.

- E Litvak, K R Foster and M H Repacholi (2002): Health and safety implications of exposure to electromagnetic fields in the frequency range 300 Hz to 10 MHz. *Bioelectromagnetics* 23(1): 68-82.
- M H Repacholi (2002). Assessment of the Health Effects of EMF Exposure. *The Radio Science Bulletin* 301: 14-24.
- L Goldstein, L Kheifets, E van Deventer, M H Repacholi (2002): Comments of the paper "Long-term exposure of Em -Pim1 transgenic mice to 898.4 MHz microwaves does not increase lymphoma incidence" Radiation Research. *Radiation Research* 158: 357-364.
- LS Goldstein, L Kheifets, E van Deventer, M H Repacholi (2002): Further comments on "Long-term Exposure of E&mgr;-Pim1 Transgenic Mice to 898.4 MHz Microwaves Does Not Increase Lymphoma Incidence" by Utteridge et al., Radiat. Res. 158, 357-364 (2002).
- J Sahl, G Mezei, R Kavet, A McMillan, A Silvers, A Sastre, L Kheifets (2002): Occupational magnetic field exposures and cardiovascular mortality in a cohort of electric utility workers. *American Journal of Epidemiology* 156:913-918.
- G Mezei, L Kheifets (2002): Clues to the possible viral etiology of childhood leukemia. *Technology* 9: 3-14.
- L Kheifets, N Thrall (2002): Electromagnetic Fields and Health. *Macmillians Guide to Pollution, in press.*
- L Kheifets, MH Repacholi, and R Saunders (2003): Thermal stress and radiation protection principles. *International Journal of Hyperthermia* 19(3) May-June 2003: 215-224.
- M W Dewhirst, M Lora-Michiels, B L Viglianti and M H Repacholi (2003): Carcinogenic effects of hyperthermia. *International Journal of Hyperthermia* 19(3) May-June 2003: 236-251.
- L S Goldstein, M W Dewhirst, M H Repacholi and L Kheifets (2003): Summary, conclusions and recommendations: adverse temperature levels in the human body. *International Journal of Hyperthermia* 19(3) May-June 2003: 373-384.
- Riadh W. Y. Habash, Lynn M. Brodsky, William Leiss, Daniel Krewski, & Michael Repacholi. Health Risks of Electromagnetic Fields. Part I: Evaluation and Assessment of Electric and Magnetic Fields. *Critical Review in Biomedical Engineering*, 31(3&4):219–273 (2003)
- A McKinlay and MH Repacholi (eds) Weak electric fields effects in the body. Radiation Protection Dosimetry 106 (4) 2003
- MH Repacholi, WHO's health risk assessment of ELF fields. Radiation Protection Dosimetry 106 (4) 297-299, 2003

WHO/IARC publications

Non-ionizing radiation, Part 1: Static and extremely low-frequency (ELF) electric and magnetic fields, IARC Monographs 80, IARC Press: Lyon, (2002), pp 429.

All press materials, WHO's Agenda for EMF Research, project progress reports, minutes of Research Co-ordination meetings, Standards Harmonization meetings and International Advisory Committee meetings can be obtained on WHO EMF Project web site at: www.who.int/emf

MEETINGS

Local, national and regional scientific meetings were held during the year at which WHO staff members participated:

June 2003	Rome, Italy for meeting on Health Aspects of EMF
July 2003	London. UK LINK Mobile Telecommunications and Health Research Programme
September 2003	Paris, France WHO Meeting on Precautionary Policies and Health
October 2003	Guilin, China to discuss the draft Chinese RF standard with the Chinese Standards Committee
October 2003	Kuala Lumpur, Malaysia to assist the Malaysian Government develop its EMF protection strategy.
November 2003	Tokyo, Japan ELF & health effects-How to deal with PP
November 2003	Sofia, Bulgaria (mobile phone issue)
November 2003	Budapest, Hungary, to give the keynote address at the 6th International Congress of the European Bioelectromagnetics Association (EBEA)
December 2003	Paris, France to provide an update on RF biological effects
January 2004	Bangkok, Thailand to provide updated information on EMF health effects and standards to countries around the Pacific rim
January 2004	Brussels, Belgium to discuss the risk communication issue within the EU (sponsored by EC/MMF/GSM Association)
March 2004	Lima, Peru (Based stations issue)
March 2004	Asuncion, Paraguay (Power lines issue)
March 2004	Ottawa, Canada, Canadian Electricity Association meeting (power line issue)
April 2004	Erice, Italy, to participate in a course on the methodology in bioelectromagnetic experimental investigations
April 2004	Madrid, Spain (Base stations issue)
May 2004	Dublin, Ireland, The Environmental Health Officers' Association EMF risk and risk perception.
May 2004	Seville, Spain ICNIRP/WHO/ICOH/URSI NIR Workshop and Symposium
May 2004	Zaragoza, Spain (Base stations issue)

Scientific Meeting Proceedings

- Non-Thermal Effects of RF Electromagnetic Fields. R Matthes, JH Bernhardt and MH Repacholi (eds) Proceedings of Munich meeting, November 1996. ICNIRP Pub. 3/97. From: ICNIRP C/- Bundesamt für Strahlenschutz, Institut für Strahlenhygiene, Ingolstädter Landstraße 1, D-85764 Oberschleißheim, Germany. Tel:+49 89 31603288, Fax:+49 89 316 03289, E-mail: RMatthes@bfs.de
- Biological Effects of Static and ELF Fields. R Matthes, JH Bernhardt and MH Repacholi (eds), Proceedings of Bologna meeting, June 1997. ICNIRP Pub. 4/97. From: ICNIRP C/- Bundesamt für Strahlenschutz, Institut für Strahlenhygiene, Ingolstädter Landstraße 1, D-85764 Oberschleißheim, Germany. Tel:+49 89 31603288, Fax:+49 89 316 03289, E-mail RMatthes@bfs.de
- Risk Perception, Risk Communication and its Application to EMF Exposure. R Matthes, JH Bernhardt and MH Repacholi (eds) Proceedings of Vienna meeting, October 1997. ICNIRP Pub 5/98. From: ICNIRP C/- Bundesamt für Strahlenschutz, Institut für Strahlenhygiene, Ingolstädter Landstraße 1, D-85764 Oberschleißheim, Germany. Tel:+49 89 31603288, Fax:+49 89 316 03289, E-mail RMatthes@bfs.de

- Electromagnetic fields: Biological effects and hygienic standardisation. MH Repacholi, NB Rubtsova and AM Muc (eds) Proceedings of International Meeting. Moscow 18-22 May 1998. WHO publication WHO/SDE/OEH/99.5, WHO Geneva 1999.
- EMF Risk Perception and Communication. MH Repacholi and AM Muc (eds) Proceedings of International Seminar on EMF Risk Perception and Communication. Ottawa, Canada 31 August-1 September 1998. WHO publication # WHO/SDE/OEH/99.01, WHO Geneva 1999.
- Health Effects of Electromagnetic Fields in the Frequency Range 300 Hz to 10 MHz. R Matthes, E van Rongen and MH Repacholi (eds) Proceedings of International Meeting, Maastricht, The Netherlands 7-8 June 1999. ICNIRP Pub 8/99. From: ICNIRP C/- Bundesamt für Strahlenschutz, Institut für Strahlenhygiene, Ingolstädter Landstraße 1, D-85764 Oberschleißheim, Germany. Tel:+49 89 31603288, Fax:+49 89 316 03289, E-mail RMatthes@bfs.de
- Effects of Electromagnetic Fields on the Living Environment. R Matthes, JH Bernhardt and MH Repacholi (eds). Proceedings of International Seminar, Ismaning, Germany 4-5 October 1999. ICNIRP Pub 10/2000. From: ICNIRP C/- Bundesamt für Strahlenschutz, Institut für Strahlenhygiene, Ingolstädter Landstraße 1, D-85764 Oberschleißheim, Germany. Tel:+49 89 31603288, Fax:+49 89 316 03289, E-mail RMatthes@bfs.de
- Biological effects, health consequences and standards for pulsed radiofrequency fields. R Matthes, JH Bernhardt and MH Repacholi (eds). Proceedings of International seminar on biological effects, health consequences and standards for pulsed radiofrequency fields. Erice, Sicily, Italy, 21-25 November 1999. ICNIRP publication 11/2001. From: ICNIRP C/- Bundesamt für Strahlenschutz, Institut für Strahlenhygiene, Ingolstädter Landstraße 1, D-85764 Oberschleißheim, Germany. Tel:+49 89 31603288, Fax:+49 89 316 03289, E-mail RMatthes@bfs.de
- Eastern European Regional EMF Meeting and Workshop "Measurements and Criteria for Standard Harmonization in the Field of EMF Exposure" and WHO EMF Standards Harmonization Meeting. Varna, Bulgaria, 28 April – 3 May 2001. M Israel & M Repacholi (eds). Published by Foundation "Faraday" – Non-ionising Radiation and Electricity.
- Adverse Temperature Levels in the Human Body Workshop. WHO, Geneva, March 21-22 2002. The proceedings of this workshop are published in the International Journal of Hyperthermia, Vol. 19, No. 3, pp. 215-384 / May-June 2003.
- A McKinlay and MH Repacholi (eds) Weak electric fields effects in the body. Radiation Protection Dosimetry 106 (4) 2003
- Proceedings of the International NIR Workshop & Symposium, Seville, Spain, 20-22 May 2004. These proceedings are available on CD-ROM, and can be ordered through EarthPrint, via the ICNIRP website http://www.icnirp.de/activities.htm

Electronic Proceedings on EMF Project Website

There are several proceedings from meetings available electronically on the EMF Project website at: http://www.who.int/peh-emf/meetings/archive/en/

- Application of the Precautionary Principle to EMF. 24-26 February 2003, European Commission, Luxembourg.
- 2nd International Workshop on Biological Effects of Electromagnetic Fields. 7-11 October

2002, Rhodes – Greece

- WHO/ICNIRP Conference on EMF Biological effects, WHO Standards Harmonization for the African region, WHO RF Research coordination meeting. 4-7 December 2001, Cape Town, South Africa.
- WHO Meeting on EMF Biological Effects, Standards Harmonization in Asia & Oceania. 22-24 October 2001, Seoul, South Korea.
- WHO Workshop: Selection Bias in EMF - Childhood Leukemia Epidemiologic Studies 27-28 July 2001, Whistler, British Columbia.
- WHO EMF Standards Harmonization - Eastern European. 28 April-3 May 2001,Varna, Bulgaria.
- Americas Regional Seminar on Bioeffects, and WHO EMF Standards Harmonization. 7-9 March 2001, Lima, Peru
- **TO BE UPDATED AFTER IAC**

FOR FURTHER INFORMATION ON THE INTERNATIONAL EMF PROJECT

Contact:
Radiation and Environmental Health
World Health Organization
20 Avenue Appia
CH-1211 Geneva 27
Switzerland
Website http://www.who.int/peh-emf/
Email emfproject@who.int
Tel +41 22 791 40 76
Fax +41 22 791 41 23